



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

VALLEY REGIONAL OFFICE

Douglas W. Domenech
Secretary of Natural Resources

4411 Early Road, P.O. Box 3000, Harrisonburg, Virginia 22801
(540) 574-7800 Fax (540) 574-7878
www.deq.virginia.gov

David K. Paylor
Director

Amy Thatcher Owens
Regional Director

July 15, 2011

Mr. John A. McCloskey
Environmental Manager
Merck Sharp & Dohme Corporation
2778 East Side Highway
Elkton, Virginia 22827

Re: Merck Sharp & Dohme Corp., VPDES Permit No. VA0002178, Rockingham County

Dear Mr. McCloskey:

Your application has been reviewed and appears to be complete. The next steps involve assembling the information necessary to develop the permit limitations and then drafting the permit. Once the draft permit is prepared and the appropriate reviews are performed, I will transmit the draft permit and supporting documentation to you for review. I expect to have this draft permit package to you within the next 2 months.

The Department of Environmental Quality strives to complete the permitting process in a timely manner. If you have any questions about our procedures or the status of your draft permit, please do not hesitate to contact us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dawn Jeffries".

Dawn Jeffries
Environmental Engineer

cc: Mr. Abhay Kirpekar (electronic copy)
Permit Processing File

**MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
VALLEY REGIONAL OFFICE**

4411 Early Road - P.O. Box 3000

Harrisonburg, VA 22801

SUBJECT: Application Errata for VPDES Permit No. VA0002178, Merck & Co., Inc., Rockingham County

TO: PP File

FROM: Dawn Jeffries

DATE: July 12, 2011

The following deficiencies were noted in the subject permit reissuance application:

Form 1

Item 1. Part II.C should indicate 'Form attached'.

Item 2. Part IV should indicate title of contact as Environmental Manager.

Item 3. Part X does not list other facility permits.

Form 2C

Item 1. Part II.A. The water balance will need to be updated in light of the permittee's statement in the cover letter that the capacity of the treatment plant is 2.1 MGD rather than 1.2 MGD.

Item 2. Part II.B.3.b. Treatment codes from Table 2C-1 were not indicated.

Item 3. Part V.A.3. Units are not indicated. PW verified by e-mail that these should be mg/l and kg/d.

Item 4. Parts V.B.&C. QLs are not indicated for ND results.

Application Addendum

Item 1. The design average flow is given in #5 as 1.2 MGD but the applicant states in the cover letter that the capacity of the facility is actually 2.1 MGD.

Sewage Sludge Application

It is noted that the information included in this form applies only to the 0.150 MGD sanitary wastewater treatment facility. Industrial sludge is not addressed by this form.

The deficiencies noted are insignificant and will not affect the preparation of a legally and technically defensible draft permit.

Reviewer Concurrence: EKM 7-15-11

Jeffries, Dawn (DEQ)

From: Kirpekar, Abhay C [abhay_kirpekar@merck.com]
Sent: Wednesday, August 31, 2011 9:02 AM
To: Jeffries, Dawn (DEQ)
Cc: McCloskey, John A
Subject: Merck - Stonewall Plant, Elkton, VA. VPDES Permit VA0002178
Attachments: Influent BOD-COD-TSS Data Analysis.xls

Dear Ms. Dawn Jeffries,

Per our phone conversation, I have analyzed the influent data for the determination of BOD, TSS and COD limits (MAL and DML).

Merck requests that the period of time used to evaluate the LTA influent COD/BOD be adjusted to five years instead of the three years listed in the Guidelines. This request is made on the belief that the highest 12 month influent load experienced in the last five years is more indicative of potential and future needs. Analysis of the influent data shows that the highest 1-year average load occurred in 2008.

Our influent load (COD/BOD) changes as a result of the amount and type of pharmaceutical products manufactured at any give time to meet the global medical needs. Future projections of existing and new pharmaceutical products at Merck -Stonewall Plant show the long term average load comparable to the average historical load; however, introduction of new products to this site is expected to increase the load variation. It is thus requested that 2008 average load be used for the calculation of BOD MAL and 95 percentile load for 2008 be used for the calculation of BOD DML.

A worksheet containing the COD/BOD data, calculation of the yearly averages, histogram for 2008 (for 95 percentile determination) and limits is attached.

If you have any questions please let me know.

Sincerely,

Abhay Kirpekar
Merck - Elkton Environmental
(540) 298-4802

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BOD Limit Calculations - MAL and DML

(1) For MAL - Merck requests that the year 2008 (LTA) BOD data be used.

From this LTA: 3287 kg/day

$MAL = 3287 \times 0.1 \times 3.0 =$	986 kg/day
--------------------------------------	------------

$DML = 986 \times 2 =$ 1972 kg/day (as per BJP)

(2) For DML - Merck requests that the year 2008 (95 percentile) BOD data be used.

From this 95% data: 7000 kg/day

$MAL = 7000 \times .1 \times 3.0 =$ 2100 kg/day

$DML = 2100 \times 2.0 =$	4200 kg/day
---------------------------	-------------

 (as per BJP)

2007-2011 BOD Permit Limits:		
MAL =	1567	kg/day
DML =	3100	kg/day

For 2012 - 2016 Permit

Request BOD permit limits		
MAL =	986	kg/day
DML =	3100	kg/day

Jeffries, Dawn (DEQ)

From: Kirpekar, Abhay C [abhay_kirpekar@merck.com]
Sent: Wednesday, July 20, 2011 12:06 PM
To: Jeffries, Dawn (DEQ)
Subject: RE: Application for Permit Reissuance
Attachments: EPA Form 2C Part V.A Page 1 Merck VPDES Permit 0002178.pdf; Merck VPDES Permit 0002178 - EPA Form 2C TOC Analysis.pdf; Merck VPDES Permit 0002178 - EPA Form 2C - Dioxin Analysis.pdf; Merck VPDES Permit 0002178 - EPA Form 2C Analysis - Part 1.pdf; Merck VPDES Permit 0002178 - EPA Form 2C - radioactivity Assays.pdf

Dear Ms. Jeffries,

Please find the items requested below:

1. Page 1 of EPA Form 2C Part V.A
2. Copy of the analysis done by Lancaster and GEL labs for parts B & C of EPA Form 2C.
3. I have not sent the copy of the permit reissuance to VDH, would greatly appreciate your sending the copy to the appropriate VDH official.
4. I verified that the grant of authority (GOA) authorizes the delegated manager to make management decisions.

If you have any questions please let me know. I will be in my office later today.

Sincerely,

Abhay Kirpekar
Merck - Elkton Environmental
(540) 298-4802

From: Jeffries, Dawn (DEQ) [mailto:Dawn.Jeffries@deq.virginia.gov]
Sent: Friday, July 15, 2011 11:49 AM
To: Kirpekar, Abhay C
Subject: Application for Permit Reissuance

Hello Mr. Kirpekar,

Thank you. I have received the model and will start on Merck's permit next week. I have a few questions at this point. In Form 2C, Part V; in section A the units are not indicated. I assume they are mg/l for concentration results and kg/d for all mass results. Please verify. Also, in sections B & C, QLs are not indicated for those parameters that were ND and 'J' is not clarified. Can you provide these for me? A copy of the lab analysis would suffice if you wish.

Did you already send copy of the application to VDH? I can send it if that hasn't already been done.

Finally, I assume from the memo granting authority to Dwayne Soisson, that at that time he met the requirement below in order to sign for the application. Please verify.

“(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing

other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures:"

Thank you again.

I will be in touch,

Dawn Jeffries

Environmental Engineer

DEQ-Valley Regional Office

P.O. Box 3000

Harrisonburg, Virginia 22801

Ph. 540-574-7898

Dawn.Jeffries@deq.virginia.gov

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Merck

Merck Sharp & Dohme Corp.
2778 South Eastside Hwy
Elkton, VA 22827
T 540 298 1211
merck.com

July 1, 2011



Ms. Dawn Jeffries
Environmental Engineer
Department of Environmental Quality
Valley Regional Office
4411 Early Road
Harrisonburg, VA 22801

RECEIVED
DEQ-Valley
JUL 05 2011

**Re: Reissuance of VPDES Permit No. VA0002178
Merck Sharp & Dohme Corp. – Stonewall Plant
Rockingham County**

To: _____
FILE: _____

Dear Ms. Jeffries:

In response to your letter of December 30, 2010, we are hereby submitting the attached documents which form our application for re-issuance of the Stonewall Plant's Virginia Pollutant Discharge Elimination System (VPDES) permit. This submittal includes all of the application forms requested in your December 30th letter, as well as the attachments supporting the application.

We would like to thank you for meeting with us on July 29th. As we discussed during our site visit, there are several items that needs to be revised and updated in the new permit:

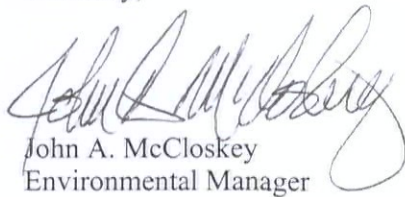
- The current permit identifies the "design flow of the industrial wastewater treatment system" as 1.2 million gallons per day (MGD) (See Footnote a. on Part I, Page 3 of 24 of the Permit). That flow actually represents the average flow to the treatment system, rather than the design capacity. Based on testing performed at the facility since the most recent permit application, we believe that the capacity of the treatment plant is at least 2.1 MGD. We request that the footnote be revised to indicate that as the design flow. Please note that we are not requesting any increases in any numerical limits or waste load allocations. We believe that 1.2 MGD is the appropriate flow rate to be utilized for calculation of mass limits. This request is simply to correct the permit to more accurately reflect the actual capacity of the existing treatment system.
- We request that a provision be added to the permit specifying the sampling periods and reporting schedules for the parameters that are sampled semi-annually at Outfall 101.

- The name of the owner of the facility should be changed to "Merck Sharp & Dohme Corp., a division of Merck & Co."
- Provision 8 under F. Other Requirements and Special Conditions in Part I of the permit and Attachment A should be removed. The sampling required under this provision has already been completed.

We look forward to working with you on the processing of this permit application.

If you have any questions or require additional information, please call me at 540-298-4122.

Sincerely,



John A. McCloskey
Environmental Manager

Attachments

1. EPA Form 3501 – General Application Form 1
 - a. Attachments to Form 1: (1) Storm Drainage Map and (2) Chemical Sewer Schematic
2. EPA Form 3510-2C
 - a. Attachments to Form 2C: (1) Topographic map, (2) Water Balance, (3) Wastewater Treatment Plant Description and (4) MSDS's for cooling water additives
3. Registration Statement for Storm Water general Permit – Outfall 002
4. VPDES Application Addendum
5. Permit Billing Information form
6. VPDES Sewage Sludge Permit Application Form
 - a. Attachments: (1) Sanitary Waste Treatment Plant description and (2) Domestic Sludge Disposal Details

FORM 1 GENERAL		U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION Consolidated Permits Program (Read the "General Instructions" before starting.)		I. EPA I.D. NUMBER	
LABEL ITEMS		PLEASE PLACE LABEL IN THIS SPACE		GENERAL INSTRUCTIONS If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.	
I. EPA I.D. NUMBER		III. FACILITY NAME		V. FACILITY MAILING ADDRESS	
VI. FACILITY LOCATION		II. POLLUTANT CHARACTERISTICS		INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms .	
SPECIFIC QUESTIONS		SPECIFIC QUESTIONS		SPECIFIC QUESTIONS	
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S. ? (FORM 2A)		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S. ? (FORM 2B)		C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	
E. Does or will this facility treat, store, or dispose of hazardous wastes ? (FORM 3)		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area ? (FORM 5)		I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area ? (FORM 5)	
III. NAME OF FACILITY		IV. FACILITY CONTACT		V. FACILITY MAILING ADDRESS	
1 SKIP Merck Sharp & Dohme Corp. - Stonewall Plant		A. NAME & TITLE (last, first, & title) 2 John A. McCloskey		B. PHONE (area code & no.) (540) 298-4122	
A. STREET OR P.O. BOX 3 2778 South Eastside Highway		B. CITY OR TOWN 4 Elkton		C. STATE VA	
D. ZIP CODE 22827		VI. FACILITY LOCATION		A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER 5 2778 South Eastside Highway	
B. COUNTY NAME Rockingham		C. CITY OR TOWN Elkton		D. STATE VA	
E. ZIP CODE 22827		F. COUNTY CODE (if known)		G. CITY OR TOWN Elkton	
H. STATE VA		I. ZIP CODE 22827		J. COUNTY CODE (if known)	

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
C	7	2833	(specify) Medicinal chemicals	C	7	2834	(specify) Pharmaceutical Preparations
15	16	17	18	15	16	17	18
C. THIRD				D. FOURTH			
C	7		(specify)	C	7		(specify)
15	16	17	18	15	16	17	18

VIII. OPERATOR INFORMATION

A. NAME															B. Is the name listed in Item VIII-A also the owner?			
C	8	Craig P Kennedy													<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
15	16														55	56		
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other," specify.)															D. PHONE (area code & no.)			
F = FEDERAL S = STATE P = PRIVATE M = PUBLIC (other than federal or state) O = OTHER (specify)															P (specify) 56		A (540) 298-4100 15 16 17 18 19 20 21 22 23 24	

E. STREET OR P.O. BOX																						
2778 South Eastside Highway																						
26															55							
F. CITY OR TOWN										G. STATE	H. ZIP CODE	IX. INDIAN LAND										
C	B	Elkton								VA	22827	Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO										
15	16									40	41	42	43	44	45	46	47	48	49	50	51	52

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)										D. PSD (Air Emissions from Proposed Sources)															
C	T	I	VA0002178							C	T	I													
9	N									9	P														
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
B. UIC (Underground Injection of Fluids)										E. OTHER (specify)															
C	T	I								C	T	I	(specify)												
9	U									9															
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
C. RCRA (Hazardous Wastes)										E. OTHER (specify)															
C	T	I								C	T	I	(specify)												
9	R									9															
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

XI. MAP


Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Manufacture of medicinal chemicals/biochemicals and pharmaceutical preparations.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Craig P. Kennedy		01-JUL-2011

COMMENTS FOR OFFICIAL USE ONLY

C	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
C																										
15																										



DATE: June 23, 2011

TO: Stonewall Plant Staff

FROM: Craig Kennedy

SUBJECT: Temporary Grant of Authority Reassignment

I will be out of the office on Merck business from June 25-July 1, 2011. During my absence, Dwayne Soisson is authorized to act on my behalf with my grant of authority, as outlined in the corporate grant of authority for MMD.

A handwritten signature in black ink, appearing to read "Craig Kennedy". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

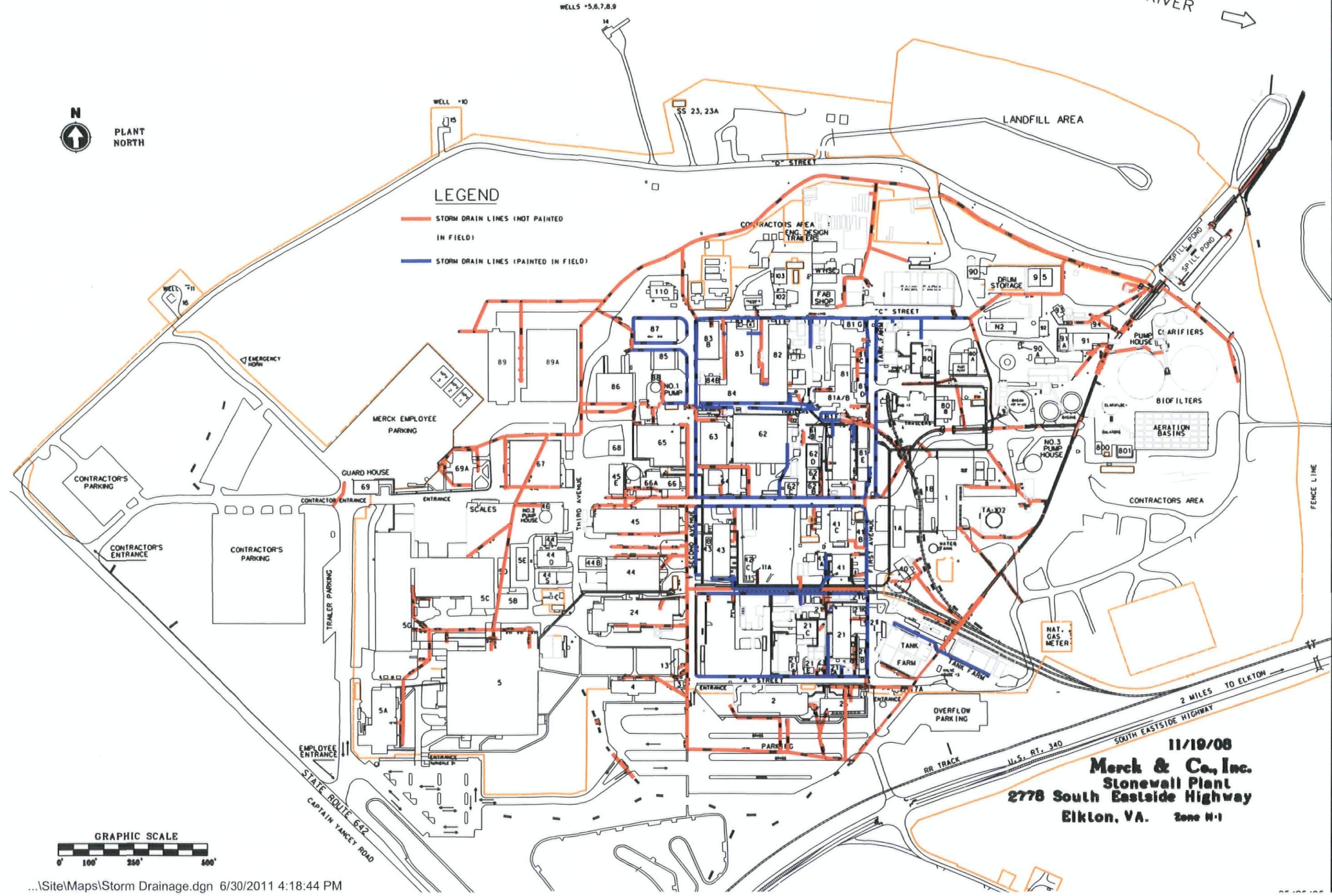
Craig Kennedy
Stonewall Plant Manager

DRAINAGE MAP

SHENANDOAH RIVER →



- LEGEND**
- STORM DRAIN LINES (NOT PAINTED IN FIELD)
 - STORM DRAIN LINES (PAINTED IN FIELD)



11/19/08
Merck & Co., Inc.
Stonewall Plant
2778 South Eastside Highway
Elkton, VA. Zone H-1

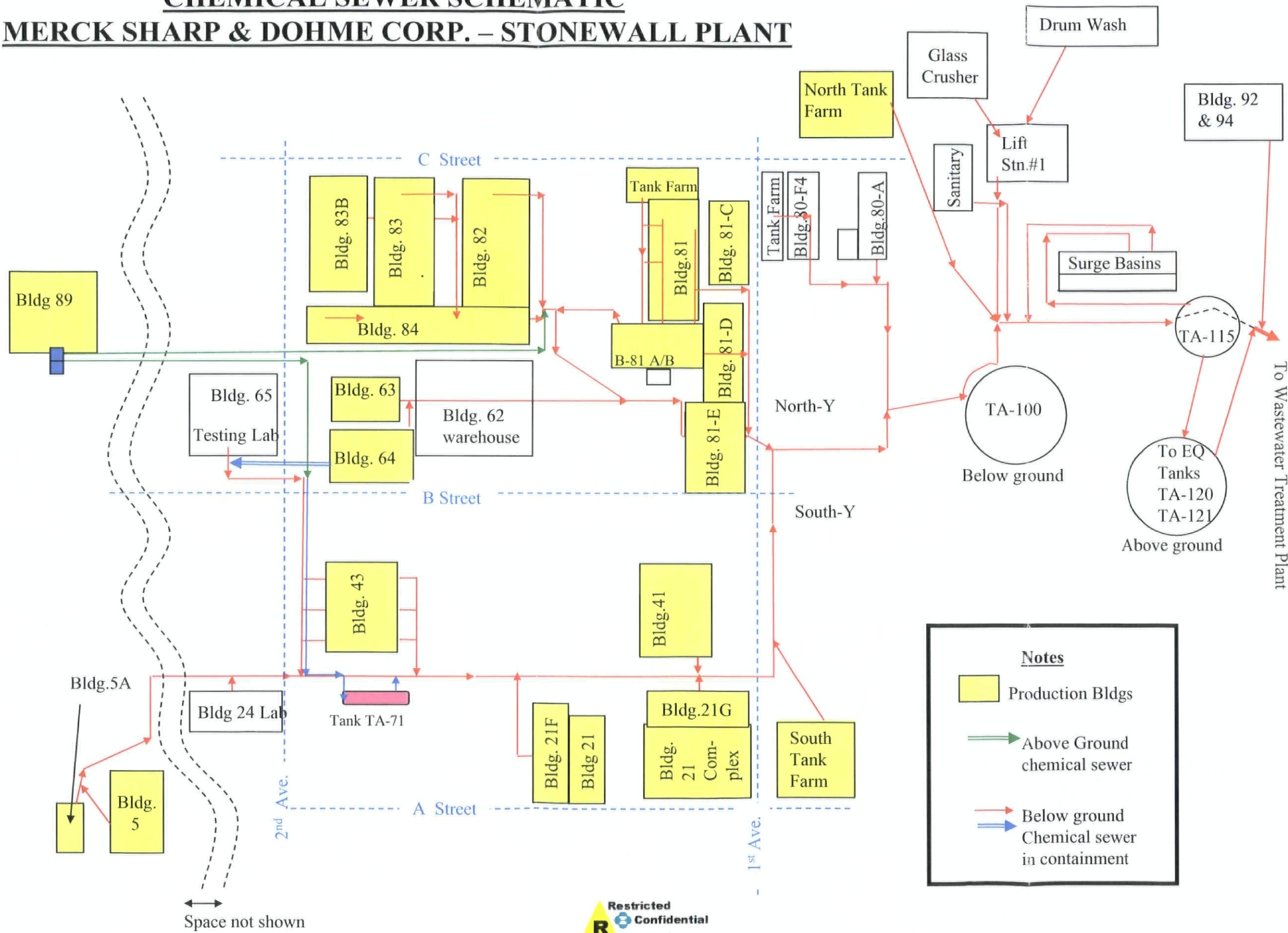
GENERAL APPLICATION FORM 1 - EPA

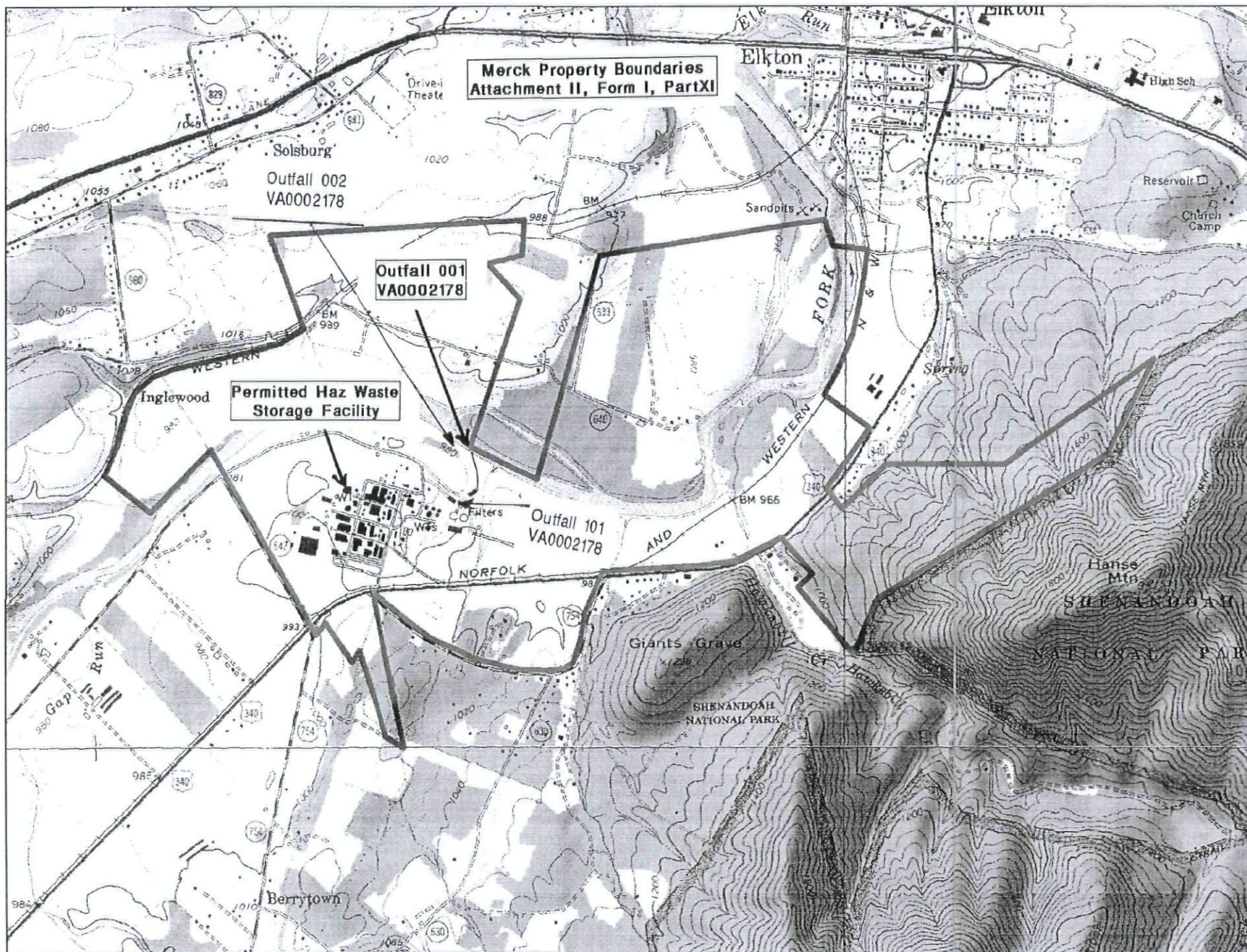
Attachment 2

Merck Sharp & Dohme Corp. – Stonewall Plant

Chemical Sewer Schematic

CHEMICAL SEWER SCHEMATIC
MERCK SHARP & DOHME CORP. – STONEWALL PLANT





NPDES APPLICATION FORM 2C

Attachment 1

Merck Sharp & Dohme Corp. – Stonewall Plant

Topographic Map

EPA I.D. NUMBER (copy from Item 1 of Form 1)

VAD0001705110

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

Please print or type in the unshaded areas only.

FORM
2C
NPDES



U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001 (see map)	38.00	23.00	15.00	78.00	38.00	40.00	South Fork Shenandoah River
002 (See map)	38.00	23.00	8.00	78.00	38.00	40.00	South Fork Shenandoah River
101 (See map)	38.00	23.00	1.00	78.00	38.00	46.00	Internal outfall

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (list)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1
001	Treated Wastewater	1.2 MGD	Biological and chemical (Flow diagram attached)	
	Non-contact cooling water	6.4 MGD	dechlorination	
	Stormwater run off	0.2 MGD	none	
002	Stormwater run off	.02 MGD	none	

RECEIVED
DFO - Valley
JUL 05 2011

To: _____
FILE: _____

OFFICIAL USE ONLY (effluent guidelines sub-categories)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?								
<input type="checkbox"/> YES (complete the following table)				<input checked="" type="checkbox"/> NO (go to Section III)				
1. OUTFALL NUMBER (list)	2. OPERATION(S) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK (specify average)	b. MONTHS PER YEAR (specify average)	a. FLOW RATE (in mgd)		B. TOTAL VOLUME (specify with units)		C. DURATION (in days)
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	

III. PRODUCTION			
A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?			
<input checked="" type="checkbox"/> YES (complete Item III-B)		<input type="checkbox"/> NO (go to Section IV)	
B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?			
<input type="checkbox"/> YES (complete Item III-C)		<input checked="" type="checkbox"/> NO (go to Section IV)	
C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.			
1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS (list outfall numbers)
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	

IV. IMPROVEMENTS					
A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operations of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.					
<input type="checkbox"/> YES (complete the following table)			<input checked="" type="checkbox"/> NO (go to Item IV-B)		
1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.	
<input checked="" type="checkbox"/> MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED	

CONTINUED FROM PAGE 2

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding - Complete one set of tables for each outfall - Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
xylene	Groundwater is pumped from interior wells to form a cone of depression and prevent the spread of contaminants - wells 2 and 3. On a long term average basis the flow contributed by these wells is only 16.5% water discharged. Bioremediation program is in place and ongoing.		

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☒ YES (list all such pollutants below)

☐ NO (go to Item VI-B)

Methyl chloride (CH₃Cl)

Total cyanide

Toluene

Chemical additives to cooling tower water and recirculating coolants - MSDS's attached.

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☒ YES (identify the test(s) and describe their purposes below)

☐ NO (go to Section VIII)

Biological Testing for acute and chronic toxicity.

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☒ YES (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)

☐ NO (go to Section IX)

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Lancaster Laboratories	2425 Holland Pike Lancaster, PA 17601	717-656-2300	Parts V.B - V.C. except radio activity
GEL Laboratories LLC	2040 Savage Road Charleston, SC 29407	843-556-8171	Radioactivity
Enviro Compliance Laboratories, Inc.	P. O. Box 919 Verona, VA 24482	540-248-1311	Fecal coliform testing

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (type or print)

Craig P. Kennedy

B. PHONE NO. (area code & no.)

(540) 298-4100

C. SIGNATURE

C. Kennedy for C. Kennedy

D. DATE SIGNED

01. JUL. 2011

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (copy from Item 1 of Form 1)
VAD001705110

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)	OUTFALL NO. 001
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PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (BOD)	33	1148	12.4	370	8.77	261.5	365	mg/l	kg/d			
b. Chemical Oxygen Demand (COD)	83	2224	34	1114	20.96	623.1	365	mg/l	kg/d			
c. Total Organic Carbon (TOC)	2.8	129.2	NA	NA	NA	NA	1	mg/l	kg/d			
d. Total Suspended Solids (TSS)	129.3	4204	39.8	1262	6.81	205.3	365	mg/l	kg/d			
e. Ammonia (as N)	12.1	334	2.8	80	1.03	29.8	365	mg/l	kg/d			
f. Flow	VALUE 12.19		VALUE 9.97		VALUE 7.78		Cont.			VALUE		
g. Temperature (winter)	VALUE 26.0		VALUE 21.5		VALUE 20.4		Cont.	°C		VALUE		
h. Temperature (summer)	VALUE 29.0		VALUE 26.2		VALUE 24.7		Cont.	°C		VALUE		
i. pH	MINIMUM 6.0	MAXIMUM 10.0	MINIMUM 7.67	MAXIMUM 8.33			Cont.	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-87-9)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
b. Chlorine, Total Residual	X		0.2	5.9	0.015	0.48	0.01	0.29	365	mg/l	kg/d			
c. Color	X		60	NA	NA	NA	NA	NA	1	CP units	NA			
d. Fecal Coliform		X	8	NA	NA	NA	NA	NA	1	cfu 100/	NA			
e. Fluoride (16984-48-8)	X		ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
f. Nitrate-Nitrite (as N)	X		1.68	77.5	NA	NA	NA	NA	1	mg/l	kg/d			

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (as N)	X		16.9	455.7	5.6	159.9	0.56	16.4	203	mg/l	kg/d			
h. Oil and Grease	X		3.1 J	143	NA	NA	NA	NA	1	mg/l	kg/d			
i. Phosphorus (as P), Total (7723-14-0)	X		.09	3.69	NA	NA	NA	NA	2	mg/l	kg/d			
j. Radioactivity														
(1) Alpha, Total		X	ND	ND	NA	NA	NA	NA	1	pCi/l	NA			
(2) Beta, Total		X	ND	ND	NA	NA	NA	NA	1	pCi/l	NA			
(3) Radium, Total		X	ND	ND	NA	NA	NA	NA	1	pCi/l	NA			
(4) Radium 226, Total		X	ND	ND	NA	NA	NA	NA	1	pCi/l	NA			
k. Sulfate (as SO ₄) (14808-79-8)	X		42.5	1961	NA	NA	NA	NA	1	mg/l	kg/d			
l. Sulfide (as S)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
m. Sulfite (as SO ₃) (14265-45-3)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
n. Surfactants	X		.049 J	2.26	NA	NA	NA	NA	1	mg/l LAS	kg/d			
o. Aluminum, Total (7429-90-5)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
p. Barium, Total (7440-39-3)	X		.0337	1.55	NA	NA	NA	NA	1	mg/l	kg/d			
q. Boron, Total (7440-42-8)	X		ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
r. Cobalt, Total (7440-48-4)	X		.00022 J	.01	NA	NA	NA	NA	1	mg/l	kg/d			
s. Iron, Total (7439-89-6)	X		2.28	105.2	NA	NA	NA	NA	1	mg/l	kg/d			
t. Magnesium, Total (7439-95-4)	X		11.8	544.4	NA	NA	NA	NA	1	mg/l	kg/d			
u. Molybdenum, Total (7439-98-7)	X		.00035 J	.016	NA	NA	NA	NA	1	mg/l	kg/d			
v. Manganese, Total (7439-96-5)	X		.0238	1.098	NA	NA	NA	NA	1	mg/l	kg/d			
w. Tin, Total (7440-31-5)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			
x. Titanium, Total (7440-32-6)		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d			

EPA I.D. NUMBER (copy from Item 1 of Form 1)

OUTFALL NUMBER

VAD001705110

001

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT								4. UNITS		5. INTAKE (optional)			
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES		
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS			
METALS, CYANIDE, AND TOTAL PHENOLS																	
1M. Antimony, Total (7440-36-0)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
2M. Arsenic, Total (7440-38-2)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
3M. Beryllium, Total (7440-41-7)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
4M. Cadmium, Total (7440-43-9)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
5M. Chromium, Total (7440-47-3)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
6M. Copper, Total (7440-50-8)	X	X		.0058	.268	NA	NA	NA	NA	1	mg/l	kg/d					
7M. Lead, Total (7439-92-1)	X		X	.000075	.003	NA	NA	NA	NA	1	mg/l	kg/d					
8M. Mercury, Total (7439-97-6)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
9M. Nickel, Total (7440-02-0)	X		X	.0015 J	.069	NA	NA	NA	NA	1	mg/l	kg/d					
10M. Selenium, Total (7782-49-2)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
11M. Silver, Total (7440-22-4)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
12M. Thallium, Total (7440-28-0)	X		X	ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
13M. Zinc, Total (7440-66-6)	X	X		.0086 J	.397	NA	NA	NA	NA	1	mg/l	kg/d					
14M. Cyanide, Total (57-12-5)	X	X		.0094 J	.434	NA	NA	NA	NA	1	mg/l	kg/d					
15M. Phenols, Total	X	X		ND	ND	NA	NA	NA	NA	1	mg/l	kg/d					
DIOXIN																	
2,3,7,8-Tetra- chlorodibenzo-P- Dioxin (1764-01-6)	X		X	DESCRIBE RESULTS Result below the LOQ of 2 pg/l in a 24 hour composite sample at Outfall 001.													

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT								4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES	
				(1)	(2)	(1)	(2)	(1)	(2)				(1)	(2)		
				CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS				CONCENTRATION	MASS		
GC/MS FRACTION – VOLATILE COMPOUNDS																
1V. Accrolein (107-02-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
2V. Acrylonitrile (107-13-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
3V. Benzene (71-43-2)	X	X		ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
4V. Bis (Chloro- methyl) Ether (542-88-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
5V. Bromoform (75-25-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
6V. Carbon Tetrachloride (56-23-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
7V. Chlorobenzene (108-90-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
8V. Chlorodi- bromomethane (124-48-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
9V. Chloroethane (75-00-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
10V. 2-Chloro- ethylvinyl Ether (110-75-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
11V. Chloroform (67-66-3)	X	X		ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
12V. Dichloro- bromomethane (75-27-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
13V. Dichloro- difluoromethane (75-71-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
14V. 1,1-Dichloro- ethane (75-34-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
15V. 1,2-Dichloro- ethane (107-06-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
16V. 1,1-Dichloro- ethylene (75-35-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
17V. 1,2-Dichloro- propane (78-87-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
18V. 1,3-Dichloro- propylene (542-75-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
19V. Ethylbenzene (100-41-4)	X	X		ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
20V. Methyl Bromide (74-83-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
21V. Methyl Chloride (74-87-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1)	(2)	(1)	(2)	(1)	(2)				(1)	(2)	
				CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS				CONCENTRATION	MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
24V. Tetrachloroethylene (127-18-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
25V. Toluene (108-88-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
26V. 1,2-Trans-Dichloroethylene (156-60-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
27V. 1,1,1-Trichloroethane (71-55-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
28V. 1,1,2-Trichloroethane (79-00-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
29V Trichloroethylene (79-01-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
30V. Trichlorofluoromethane (75-69-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
31V. Vinyl Chloride (75-01-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
2A. 2,4-Dichlorophenol (120-83-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
3A. 2,4-Dimethylphenol (105-67-9)	X			ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
4A. 4,6-Dinitro-O-Cresol (534-52-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
5A. 2,4-Dinitrophenol (51-28-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
6A. 2-Nitrophenol (88-75-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
7A. 4-Nitrophenol (100-02-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
8A. P-Chloro-M-Cresol (59-50-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
9A. Pentachlorophenol (87-86-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
10A. Phenol (108-95-2)	X	X		ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
11A. 2,4,6-Trichlorophenol (88-05-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
2B. Acenaphtylene (208-96-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
3B. Anthracene (120-12-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
4B. Benzidine (92-87-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
5B. Benzo (a) Anthracene (56-55-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
6B. Benzo (a) Pyrene (50-32-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
7B. 3,4-Benzo- fluoranthene (205-99-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
8B. Benzo (ghi) Perylene (191-24-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
9B. Benzo (k) Fluoranthene (207-08-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
10B. Bis (2-Chloro- ethoxy) Methane (111-91-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
11B. Bis (2-Chloro- ethyl) Ether (111-44-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
12B. Bis (2- Chloroisopropyl) Ether (102-80-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
13B. Bis (2-Ethyl- hexyl) Phthalate (117-81-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
15B. Butyl Benzyl Phthalate (85-68-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
16B. 2-Chloro- naphthalene (91-58-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
17B. 4-Chloro- phenyl Phenyl Ether (7005-72-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
18B. Chrysene (218-01-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
19B. Dibenzo (a,h) Anthracene (53-70-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
20B. 1,2-Dichloro- benzene (95-50-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			
21B. 1,3-Di-chloro- benzene (541-73-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d			

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT								4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS		
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)																
22B. 1,4-Dichloro- benzene (106-46-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
23B. 3,3-Dichloro- benzidine (91-94-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
24B. Diethyl Phthalate (84-66-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
25B. Dimethyl Phthalate (131 -11-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
26B. Di-N-Butyl Phthalate (84-74-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
27B. 2,4-Dinitro- toluene (121-14-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
28B. 2,6-Dinitro- toluene (606-20-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
29B. Di-N-Octyl Phthalate (117-84-0)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
30B. 1,2-Diphenyl- hydrazine (as Azo- benzene) (122-66-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
31B. Fluoranthene (206-44-0)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
32B. Fluorene (86-73-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
33B. Hexachloro- benzene (118-74-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
34B. Hexachloro- butadiene (87-68-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
35B. Hexachloro- cyclopentadiene (77-47-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
36B Hexachloro- ethane (67-72-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
38B. Isophorone (78-59-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
39B. Naphthalene (91-20-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
40B. Nitrobenzene (98-95-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
41B. N-Nitro- sodimethylamine (62-75-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
42B. N-Nitrosodi- N-Propylamine (621-64-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)						
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES				
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS					
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)																			
43B. N-Nitro- sodiphenylamine (86-30-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
44B. Phenanthrene (85-01-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
45B. Pyrene (129-00-0)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
46B. 1,2,4-Tri- chlorobenzene (120-82-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
GC/MS FRACTION – PESTICIDES																			
1P. Aldrin (309-00-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
2P. α-BHC (319-84-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
3P. β-BHC (319-85-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
4P. γ-BHC (58-89-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
5P. δ-BHC (319-86-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
6P. Chlordane (57-74-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
7P. 4,4'-DDT (50-29-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
8P. 4,4'-DDE (72-55-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
9P. 4,4'-DDD (72-54-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
10P. Dieldrin (60-57-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
11P. α-Endosulfan (115-29-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
12P. β-Endosulfan (115-29-7)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
13P. Endosulfan Sulfate (1031-07-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
14P. Endrin (72-20-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
15P. Endrin Aldehyde (7421-93-4)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							
16P. Heptachlor (76-44-8)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d							

EPA I.D. NUMBER (copy from Item 1 of Form 1)

OUTFALL NUMBER

VAD001705110

001

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT								4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCEN- TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS		
GC/MS FRACTION – PESTICIDES (continued)																
17P. Heptachlor Epoxide (1024-57-3)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
18P. PCB-1242 (53469-21-9)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
19P. PCB-1254 (11097-69-1)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
20P. PCB-1221 (11104-28-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
21P. PCB-1232 (11141-16-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
22P. PCB-1248 (12672-29-6)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
23P. PCB-1260 (11096-82-5)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
24P. PCB-1016 (12674-11-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				
25P. Toxaphene (8001-35-2)	X		X	ND	ND	NA	NA	NA	NA	1	ug/l	kg/d				

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Merck & Co., Inc. - VA
RY84-200
PO Box 3500
Rahway NJ 07065

May 24, 2011

Project: NPDES

Submittal Date: 05/05/2011

Group Number: 1245304

PO Number: 8100017792

State of Sample Origin: VA

Client Sample Description

Outfall 001 24Hr Composite Water Sample
Water Quality Monitoring
Field Blank Grab Water Sample
Water Quality Monitoring
Trip Blank Water Sample
Water Quality Monitoring

Lancaster Labs #

6277476

6277478

6277479

Collected

05/03/2011 00:00

05/04/2011

05/03/2011

Through

05/04/2011 00:00

METHODOLOGY

The specified methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO

Merck & Co., Inc. - VA

Attn: Abhay Kirpekar

Questions? Contact your Client Services Representative
Natalie R Luciano at (717) 656-2300 Ext. 1881

Respectfully Submitted,



Robin C. Runkle
Senior Specialist

Merck & Co., Inc. - VA				Report Date: 5/24/2011 15:18	
Project: NPDES				Submit Date: 5/5/2011 8:00	
SDG:					
		6277476	Comment	6277478	
Analysis Name	Units	Outfall 001	MDL	Field Blank	MDL
		Result		Result	
Acrolein	ug/l	N.D.	10	N.D.	10
Acrylonitrile	ug/l	N.D.	10	N.D.	10
Benzene	ug/l	N.D.	0.9	N.D.	0.9
Bromodichloromethane	ug/l	N.D.	0.7	N.D.	0.7
Bromoform	ug/l	N.D.	0.8	N.D.	0.8
Bromomethane	ug/l	N.D.	2	N.D.	2
Carbon Tetrachloride	ug/l	N.D.	1	N.D.	1
Chlorobenzene	ug/l	N.D.	0.8	N.D.	0.8
Chloroethane	ug/l	N.D.	2	N.D.	2
2-Chloroethyl Vinyl Ether	ug/l	N.D.	2	N.D.	2
Chloroform	ug/l	N.D.	1	N.D.	1
Chloromethane	ug/l	N.D.	2	N.D.	2
Dibromochloromethane	ug/l	N.D.	1	N.D.	1
Dichlorodifluoromethane	ug/l	N.D.	2	N.D.	2
1,1-Dichloroethane	ug/l	N.D.	1	N.D.	1
1,2-Dichloroethane	ug/l	N.D.	1	N.D.	1
1,1-Dichloroethene	ug/l	N.D.	0.9	N.D.	0.9
trans-1,2-Dichloroethene	ug/l	N.D.	1	N.D.	1
1,2-Dichloropropane	ug/l	N.D.	1	N.D.	1
cis-1,3-Dichloropropene	ug/l	N.D.	1	N.D.	1
trans-1,3-Dichloropropene	ug/l	N.D.	0.6	N.D.	0.6
Ethylbenzene	ug/l	N.D.	0.8	N.D.	0.8
Methylene Chloride	ug/l	N.D.	2	N.D.	2
1,1,2,2-Tetrachloroethane	ug/l	N.D.	1	N.D.	1
Tetrachloroethene	ug/l	N.D.	1	N.D.	1
Toluene	ug/l	N.D.	0.8	N.D.	0.8
1,1,1-Trichloroethane	ug/l	N.D.	1	N.D.	1
1,1,2-Trichloroethane	ug/l	N.D.	1	N.D.	1
Trichloroethene	ug/l	N.D.	1	N.D.	1
Trichlorofluoromethane	ug/l	N.D.	2	N.D.	2
Vinyl Chloride	ug/l	N.D.	2	N.D.	2
Acenaphthene	ug/l	N.D.	0.4	N.D.	0.3
Acenaphthylene	ug/l	N.D.	0.4	N.D.	0.3
Anthracene	ug/l	N.D.	0.2	N.D.	0.2
Benzidine	ug/l	N.D.	24	N.D.	21
Benzo(a)anthracene	ug/l	N.D.	0.2	N.D.	0.2
Benzo(a)pyrene	ug/l	N.D.	0.4	N.D.	0.3
Benzo(b)fluoranthene	ug/l	N.D.	0.4	N.D.	0.3
Benzo(g,h,i)perylene	ug/l	N.D.	0.2	N.D.	0.2
Benzo(k)fluoranthene	ug/l	N.D.	0.4	N.D.	0.3
4-Bromophenyl-phenylether	ug/l	N.D.	0.4	N.D.	0.3
Butylbenzylphthalate	ug/l	N.D.	0.9	N.D.	0.8
Di-n-butylphthalate	ug/l	N.D.	0.6	N.D.	0.5
4-Chloro-3-methylphenol	ug/l	N.D.	0.4	N.D.	0.3
bis(2-Chloroethoxy)methane	ug/l	N.D.	0.6	N.D.	0.5
bis(2-Chloroethyl)ether	ug/l	N.D.	0.5	N.D.	0.4
bis(2-Chloroisopropyl)ether	ug/l	N.D.	0.4	N.D.	0.3
2-Chloronaphthalene	ug/l	N.D.	0.2	N.D.	0.2
2-Chlorophenol	ug/l	N.D.	0.4	N.D.	0.3
4-Chlorophenyl-phenylether	ug/l	N.D.	0.4	N.D.	0.3
Chrysene	ug/l	N.D.	0.2	N.D.	0.2
Dibenz(a,h)anthracene	ug/l	N.D.	0.5	N.D.	0.4
1,2-Dichlorobenzene	ug/l	N.D.	0.4	N.D.	0.3
1,3-Dichlorobenzene	ug/l	N.D.	0.4	N.D.	0.3
1,4-Dichlorobenzene	ug/l	N.D.	0.4	N.D.	0.3

Project: NPDES

Submit Date: 5/5/2011 8:00

SDG:

		6277476		Comment	6277478	
		Outfall 001	MDL		Field Blank	MDL
Analysis Name	Units					
3,3'-Dichlorobenzidine	ug/l	N.D.	0.9	LOQ = 5	N.D.	0.8
2,4-Dichlorophenol	ug/l	N.D.	0.4		N.D.	0.3
Diethylphthalate	ug/l	1 J	0.4		N.D.	0.3
2,4-Dimethylphenol	ug/l	N.D.	0.4		N.D.	0.3
Dimethylphthalate	ug/l	N.D.	1		N.D.	1
4,6-Dinitro-2-methylphenol	ug/l	N.D.	5		N.D.	4
2,4-Dinitrophenol	ug/l	N.D.	12		N.D.	11
2,4-Dinitrotoluene	ug/l	N.D.	0.5		N.D.	0.4
2,6-Dinitrotoluene	ug/l	N.D.	0.4		N.D.	0.3
1,2-Diphenylhydrazine	ug/l	N.D.	0.2		N.D.	0.2
bis(2-Ethylhexyl)phthalate	ug/l	N.D.	1		N.D.	1
Fluoranthene	ug/l	N.D.	0.4		N.D.	0.3
Fluorene	ug/l	N.D.	0.4		N.D.	0.3
Hexachlorobenzene	ug/l	N.D.	1		N.D.	1
Hexachlorobutadiene	ug/l	N.D.	0.9		N.D.	0.8
Hexachlorocyclopentadiene	ug/l	N.D.	2		N.D.	2
Hexachloroethane	ug/l	N.D.	0.5		N.D.	0.4
Indeno(1,2,3-cd)pyrene	ug/l	N.D.	0.4		N.D.	0.3
Isophorone	ug/l	N.D.	0.4		N.D.	0.3
Naphthalene	ug/l	N.D.	0.2		N.D.	0.2
Nitrobenzene	ug/l	N.D.	0.6		N.D.	0.5
2-Nitrophenol	ug/l	N.D.	0.5		N.D.	0.4
4-Nitrophenol	ug/l	N.D.	6		N.D.	5
N-Nitroso-di-n-propylamine	ug/l	N.D.	0.5		N.D.	0.4
N-Nitrosodimethylamine	ug/l	N.D.	0.5		N.D.	0.4
N-Nitrosodiphenylamine	ug/l	N.D.	0.4		N.D.	0.3
Di-n-octylphthalate	ug/l	N.D.	0.6		N.D.	0.5
Pentachlorophenol	ug/l	N.D.	4		N.D.	3
Phenanthrene	ug/l	N.D.	0.2		N.D.	0.2
Phenol	ug/l	3 J	0.5		N.D.	0.4
Pyrene	ug/l	N.D.	0.2		N.D.	0.2
1,2,4-Trichlorobenzene	ug/l	N.D.	0.4		N.D.	0.3
2,4,6-Trichlorophenol	ug/l	N.D.	0.8		N.D.	0.7
Aldrin	ug/l	N.D.	0.0027		N.D.	0.0022
Alpha BHC	ug/l	N.D.	0.0044		N.D.	0.0035
Beta BHC	ug/l	N.D.	0.0067		N.D.	0.0054
Gamma BHC - Lindane	ug/l	N.D.	0.0034		N.D.	0.0027
Chlordane	ug/l	N.D.	0.096		N.D.	0.077
p,p-DDD	ug/l	N.D.	0.0068		N.D.	0.0055
p,p-DDE	ug/l	N.D.	0.0068		N.D.	0.0055
p,p-DDT	ug/l	N.D.	0.0068		N.D.	0.0055
Delta BHC	ug/l	N.D.	0.0052		N.D.	0.0042
Dieldrin	ug/l	N.D.	0.0070		N.D.	0.0056
Endosulfan I	ug/l	N.D.	0.0070		N.D.	0.0056
Endosulfan II	ug/l	N.D.	0.015		N.D.	0.012
Endosulfan Sulfate	ug/l	N.D.	0.0068		N.D.	0.0055
Endrin	ug/l	N.D.	0.0096		N.D.	0.0077
Endrin Aldehyde	ug/l	N.D.	0.027		N.D.	0.022
Heptachlor	ug/l	N.D.	0.0036		N.D.	0.0028
Heptachlor Epoxide	ug/l	N.D.	0.0036		N.D.	0.0028
PCB-1016	ug/l	N.D.	0.14		N.D.	0.11
PCB-1221	ug/l	N.D.	0.41		N.D.	0.33
PCB-1232	ug/l	N.D.	0.53		N.D.	0.43
PCB-1242	ug/l	N.D.	0.14		N.D.	0.11
PCB-1248	ug/l	N.D.	0.14		N.D.	0.11
PCB-1254	ug/l	N.D.	0.14		N.D.	0.11
PCB-1260	ug/l	N.D.	0.14		N.D.	0.11
Toxaphene	ug/l	N.D.	1.4		N.D.	1.1

Project: NPDES

Submit Date: 5/5/2011 8:00

SDG:

		6277476		Comment	6277478	
		Outfall 001	MDL		Field Blank	MDL
Analysis Name	Units					
Aluminum	mg/l	N.D.	0.0834		N.D.	0.0834
Boron	mg/l	N.D.	0.0138		N.D.	0.0138
Chromium	mg/l	N.D.	0.0034		N.D.	0.0034
Iron	mg/l	2.28	0.0522		N.D.	0.0522
Magnesium	mg/l	11.8	0.0172		N.D.	0.0172
Antimony	mg/l	N.D.	0.00030		N.D.	0.00030
Arsenic	mg/l	N.D.	0.00095		N.D.	0.00095
Barium	mg/l	0.0337	0.00053		N.D.	0.00053
Beryllium	mg/l	N.D.	0.00013		N.D.	0.00013
Cadmium	mg/l	N.D.	0.00020		N.D.	0.00020
Cobalt	mg/l	0.00022 J	0.00010		N.D.	0.00010
Copper	mg/l	0.0058	0.00038		N.D.	0.00038
Lead	mg/l	0.000075 J	0.000052		N.D.	0.000052
Manganese	mg/l	0.0238	0.00040		N.D.	0.00040
Molybdenum	mg/l	0.00035 J	0.00025		N.D.	0.00025
Nickel	mg/l	0.0015 J	0.00050		N.D.	0.00050
Selenium	mg/l	N.D.	0.00025		N.D.	0.00025
Silver	mg/l	N.D.	0.000080		N.D.	0.000080
Thallium	mg/l	N.D.	0.00015		N.D.	0.00015
Tin	mg/l	N.D.	0.00040		N.D.	0.00040
Titanium	mg/l	N.D.	0.0052		N.D.	0.0052
Zinc	mg/l	0.0086 J	0.0040		N.D.	0.0040
Mercury	mg/l	N.D.	0.000046		N.D.	0.000046
Bromide	mg/l	N.D.	2.0		N.D.	0.40
Fluoride	mg/l	N.D.	0.40		0.11	0.080
Sulfate	mg/l	42.5	1.5		N.D.	0.30
Total Cyanide (water)	mg/l	0.0094 J	0.0050		N.D.	0.0050
Phenols (water)	mg/l	N.D.	0.015		N.D.	0.015
HEM (oil & grease)	mg/l	3.1 J	1.4		2.7 J	1.4
Color	C P units	60.0	5.0		N.D.	5.0
Sulfide	mg/l	N.D.	0.054		N.D.	0.054
Sulfite	mg/l	N.D.	1.5		N.D.	1.5
M. B. A. S.	mg/l LAS MW 320	0.049 J	0.040		N.D.	0.040
		6277479		Comment		
		Trip Blank	MDL			
Analysis Name	Units	Result	MDL			
Acrolein	ug/l	N.D.	10			
Acrylonitrile	ug/l	N.D.	10			
Benzene	ug/l	N.D.	0.9			
Bromodichloromethane	ug/l	N.D.	0.7			
Bromoform	ug/l	N.D.	0.8			
Bromomethane	ug/l	N.D.	2			
Carbon Tetrachloride	ug/l	N.D.	1			
Chlorobenzene	ug/l	N.D.	0.8			
Chloroethane	ug/l	N.D.	2			
2-Chloroethyl Vinyl Ether	ug/l	N.D.	2			
Chloroform	ug/l	N.D.	1			
Chloromethane	ug/l	N.D.	2			
Dibromochloromethane	ug/l	N.D.	1			
Dichlorodifluoromethane	ug/l	N.D.	2			
1,1-Dichloroethane	ug/l	N.D.	1			
1,2-Dichloroethane	ug/l	N.D.	1			
1,1-Dichloroethene	ug/l	N.D.	0.9			
trans-1,2-Dichloroethene	ug/l	N.D.	1			
1,2-Dichloropropane	ug/l	N.D.	1			
cis-1,3-Dichloropropene	ug/l	N.D.	1			

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6277476			Comment	6277478		
Analysis Name	Units	Outfall 001	MDL	Field Blank	MDL	
trans-1,3-Dichloropropene	ug/l	N.D.	0.6			
Ethylbenzene	ug/l	N.D.	0.8			
Methylene Chloride	ug/l	4 J	2			
1,1,2,2-Tetrachloroethane	ug/l	N.D.	1			
Tetrachloroethene	ug/l	N.D.	1			
Toluene	ug/l	N.D.	0.8			
1,1,1-Trichloroethane	ug/l	N.D.	1			
1,1,2-Trichloroethane	ug/l	N.D.	1			
Trichloroethene	ug/l	N.D.	1			
Trichlorofluoromethane	ug/l	N.D.	2			
Vinyl Chloride	ug/l	N.D.	2			
Acenaphthene	ug/l	n.a.	n.a.			
Acenaphthylene	ug/l	n.a.	n.a.			
Anthracene	ug/l	n.a.	n.a.			
Benzidine	ug/l	n.a.	n.a.			
Benzo(a)anthracene	ug/l	n.a.	n.a.			
Benzo(a)pyrene	ug/l	n.a.	n.a.			
Benzo(b)fluoranthene	ug/l	n.a.	n.a.			
Benzo(g,h,i)perylene	ug/l	n.a.	n.a.			
Benzo(k)fluoranthene	ug/l	n.a.	n.a.			
4-Bromophenyl-phenylether	ug/l	n.a.	n.a.			
Butylbenzylphthalate	ug/l	n.a.	n.a.			
Di-n-butylphthalate	ug/l	n.a.	n.a.			
4-Chloro-3-methylphenol	ug/l	n.a.	n.a.			
bis(2-Chloroethoxy)methane	ug/l	n.a.	n.a.			
bis(2-Chloroethyl)ether	ug/l	n.a.	n.a.			
bis(2-Chloroisopropyl)ether	ug/l	n.a.	n.a.			
2-Chloronaphthalene	ug/l	n.a.	n.a.			
2-Chlorophenol	ug/l	n.a.	n.a.			
4-Chlorophenyl-phenylether	ug/l	n.a.	n.a.			
Chrysene	ug/l	n.a.	n.a.			
Dibenz(a,h)anthracene	ug/l	n.a.	n.a.			
1,2-Dichlorobenzene	ug/l	n.a.	n.a.			
1,3-Dichlorobenzene	ug/l	n.a.	n.a.			
1,4-Dichlorobenzene	ug/l	n.a.	n.a.			
3,3'-Dichlorobenzidine	ug/l	n.a.	n.a.			
2,4-Dichlorophenol	ug/l	n.a.	n.a.			
Diethylphthalate	ug/l	n.a.	n.a.			
2,4-Dimethylphenol	ug/l	n.a.	n.a.			
Dimethylphthalate	ug/l	n.a.	n.a.			
4,6-Dinitro-2-methylphenol	ug/l	n.a.	n.a.			
2,4-Dinitrophenol	ug/l	n.a.	n.a.			
2,4-Dinitrotoluene	ug/l	n.a.	n.a.			
2,6-Dinitrotoluene	ug/l	n.a.	n.a.			
1,2-Diphenylhydrazine	ug/l	n.a.	n.a.			
bis(2-Ethylhexyl)phthalate	ug/l	n.a.	n.a.			
Fluoranthene	ug/l	n.a.	n.a.			
Fluorene	ug/l	n.a.	n.a.			
Hexachlorobenzene	ug/l	n.a.	n.a.			
Hexachlorobutadiene	ug/l	n.a.	n.a.			
Hexachlorocyclopentadiene	ug/l	n.a.	n.a.			
Hexachloroethane	ug/l	n.a.	n.a.			
Indeno(1,2,3-cd)pyrene	ug/l	n.a.	n.a.			
Isophorone	ug/l	n.a.	n.a.			
Naphthalene	ug/l	n.a.	n.a.			
Nitrobenzene	ug/l	n.a.	n.a.			
2-Nitrophenol	ug/l	n.a.	n.a.			
4-Nitrophenol	ug/l	n.a.	n.a.			

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		6277476		Comment	6277478	
Analysis Name	Units	Outfall 001	MDL		Field Blank	MDL
N-Nitroso-di-n-propylamine	ug/l	n.a.	n.a.			
N-Nitrosodimethylamine	ug/l	n.a.	n.a.			
N-Nitrosodiphenylamine	ug/l	n.a.	n.a.			
Di-n-octylphthalate	ug/l	n.a.	n.a.			
Pentachlorophenol	ug/l	n.a.	n.a.			
Phenanthrene	ug/l	n.a.	n.a.			
Phenol	ug/l	n.a.	n.a.			
Pyrene	ug/l	n.a.	n.a.			
1,2,4-Trichlorobenzene	ug/l	n.a.	n.a.			
2,4,6-Trichlorophenol	ug/l	n.a.	n.a.			
Aldrin	ug/l	n.a.	n.a.			
Alpha BHC	ug/l	n.a.	n.a.			
Beta BHC	ug/l	n.a.	n.a.			
Gamma BHC - Lindane	ug/l	n.a.	n.a.			
Chlordane	ug/l	n.a.	n.a.			
p,p-DDD	ug/l	n.a.	n.a.			
p,p-DDE	ug/l	n.a.	n.a.			
p,p-DDT	ug/l	n.a.	n.a.			
Delta BHC	ug/l	n.a.	n.a.			
Dieldrin	ug/l	n.a.	n.a.			
Endosulfan I	ug/l	n.a.	n.a.			
Endosulfan II	ug/l	n.a.	n.a.			
Endosulfan Sulfate	ug/l	n.a.	n.a.			
Endrin	ug/l	n.a.	n.a.			
Endrin Aldehyde	ug/l	n.a.	n.a.			
Heptachlor	ug/l	n.a.	n.a.			
Heptachlor Epoxide	ug/l	n.a.	n.a.			
PCB-1016	ug/l	n.a.	n.a.			
PCB-1221	ug/l	n.a.	n.a.			
PCB-1232	ug/l	n.a.	n.a.			
PCB-1242	ug/l	n.a.	n.a.			
PCB-1248	ug/l	n.a.	n.a.			
PCB-1254	ug/l	n.a.	n.a.			
PCB-1260	ug/l	n.a.	n.a.			
Toxaphene	ug/l	n.a.	n.a.			
Aluminum	mg/l	n.a.	n.a.			
Boron	mg/l	n.a.	n.a.			
Chromium	mg/l	n.a.	n.a.			
Iron	mg/l	n.a.	n.a.			
Magnesium	mg/l	n.a.	n.a.			
Antimony	mg/l	n.a.	n.a.			
Arsenic	mg/l	n.a.	n.a.			
Barium	mg/l	n.a.	n.a.			
Beryllium	mg/l	n.a.	n.a.			
Cadmium	mg/l	n.a.	n.a.			
Cobalt	mg/l	n.a.	n.a.			
Copper	mg/l	n.a.	n.a.			
Lead	mg/l	n.a.	n.a.			
Manganese	mg/l	n.a.	n.a.			
Molybdenum	mg/l	n.a.	n.a.			
Nickel	mg/l	n.a.	n.a.			
Selenium	mg/l	n.a.	n.a.			
Silver	mg/l	n.a.	n.a.			
Thallium	mg/l	n.a.	n.a.			
Tin	mg/l	n.a.	n.a.			
Titanium	mg/l	n.a.	n.a.			
Zinc	mg/l	n.a.	n.a.			
Mercury	mg/l	n.a.	n.a.			

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6277476				Comment	6277478		
Analysis Name	Units	Outfall 001	MDL		Field Blank	MDL	
Bromide	mg/l	n.a.	n.a.				
Fluoride	mg/l	n.a.	n.a.				
Sulfate	mg/l	n.a.	n.a.				
Total Cyanide (water)	mg/l	n.a.	n.a.				
Phenols (water)	mg/l	n.a.	n.a.				
HEM (oil & grease)	mg/l	n.a.	n.a.				
Color	C P units	n.a.	n.a.				
Sulfide	mg/l	n.a.	n.a.				
Sulfite	mg/l	n.a.	n.a.				
M. B. A. S.	mg/l LAS MW 320	n.a.	n.a.				

CAT No.	Analysis Name	Method	Trial ID	Batch	Analysis Date/Time	Analyst	Dilution
6277476 Outfall 001 24Hr Composite Water Sample							
10371	EPA 624 water	EPA 624	1	M111291AA	5/9/11 1023	Lauren C Temple	1
10334	Method 625	EPA 625	1	11125WAH625	5/9/11 0949	Brian K Graham	1
08108	625 Water Extraction	EPA 625	1	11125WAH625	5/6/11 0930	Olivia Arosemena	1
07572	Pesticides/PCBs in Water	EPA 608	1	111270008A	5/10/11 1931	Lisa A Reinert	1
10241	Method 608 Water Extraction	EPA 608	1	111270008A	5/9/11 0330	Roman Kuropatkin	1
01743	Aluminum	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1803	John P Hook	1
08014	Boron	EPA 200.7 rev 4.4	1	111265716001	5/9/11 2219	John W Yanzuk II	1
07051	Chromium	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1803	John P Hook	1
01754	Iron	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1803	John P Hook	1
01757	Magnesium	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1803	John P Hook	1
06024	Antimony	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06025	Arsenic	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06026	Barium	EPA 200.8 rev 5.4	1	111257050001D	5/9/11 1618	Choon Y Tian	1
06027	Beryllium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06028	Cadmium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06032	Cobalt	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06033	Copper	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06035	Lead	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06037	Manganese	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06038	Molybdenum	EPA 200.8 rev 5.4	1	111257050001C	5/9/11 1618	Choon Y Tian	1
06039	Nickel	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06041	Selenium	EPA 200.8 rev 5.4	1	111257050001B	5/9/11 1618	Choon Y Tian	1
06042	Silver	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06045	Thallium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06046	Tin	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06047	Titanium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
06049	Zinc	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1618	Choon Y Tian	1
00259	Mercury	EPA 245.1 rev 3	2	111255714002	5/6/11 1045	Damary Valentin	1
05716	EPA 600 ICP Digest (tot rec)	EPA 200.7 rev 4.4	1	111265716001	5/9/11 0907	Denise K Conners	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	111257050001	5/6/11 0900	Denise K Conners	1
05714	PW/WW Hg Digest	EPA 245.1 rev 3	1	111255714002	5/5/11 1630	Nelli S Markaryan	1
01505	Bromide	EPA 300.0	1	11136196902A	5/16/11 2221	Ashley M Adams	5
01504	Fluoride	EPA 300.0	1	11136196902A	5/16/11 2221	Ashley M Adams	5
00228	Sulfate	EPA 300.0	1	11136196902A	5/16/11 2221	Ashley M Adams	5
00237	Total Cyanide (water)	EPA 335.4	1	11137102101B	5/17/11 1852	Joseph E McKenzie	1
00434	Phenols (water)	EPA 420.4	1	11131113101A	5/13/11 0907	K Robert Caulfeild-James	1
00492	Cyanide Water Distillation	EPA 335.4	2	11137102101B	5/17/11 0915	Nancy J Shoop	1
00491	Phenol Distillation (water)	EPA 420.4	1	11131113101A	5/11/11 1445	Carolyn M Mastropietro	1
08079	HEM (oil & grease)	EPA 1664A	1	11132807901A	5/12/11 0608	Valerie J Trout	1
00277	Color	SM20 2120 B	1	11125027701A	5/5/11 1840	Luz M Groff	1
00230	Sulfide	SM20 4500 S2 D	1	11131023001A	5/11/11 0830	Susan E Hibner	1
00229	Sulfite	SM20 4500 SO3 B	1	11136022901A	5/16/11 1405	Michele L Graham	1
00225	M. B. A. S.	SM20 5540 C	1	11125022502A	5/5/11 2310	Daniel S Smith	1
6277478 Field Blank Grab Water Sample							
10371	EPA 624 water	EPA 624	1	M111291AA	5/9/11 1113	Lauren C Temple	1
10334	Method 625	EPA 625	1	11125WAH625	5/9/11 1041	Brian K Graham	1
08108	625 Water Extraction	EPA 625	1	11125WAH625	5/6/11 0930	Olivia Arosemena	1
07572	Pesticides/PCBs in Water	EPA 608	1	111270008A	5/10/11 1955	Lisa A Reinert	1
10241	Method 608 Water Extraction	EPA 608	1	111270008A	5/9/11 0330	Roman Kuropatkin	1
01743	Aluminum	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1816	John P Hook	1
08014	Boron	EPA 200.7 rev 4.4	1	111265716001	5/9/11 2233	John W Yanzuk II	1

CAT No.	Analysis Name	Method	Trial ID	Batch	Analysis Date/Time	Analyst	Dilution
07051	Chromium	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1816	John P Hook	1
01754	Iron	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1816	John P Hook	1
01757	Magnesium	EPA 200.7 rev 4.4	1	111265716001	5/9/11 1816	John P Hook	1
06024	Antimony	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06025	Arsenic	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06026	Barium	EPA 200.8 rev 5.4	1	111257050001D	5/9/11 1625	Choon Y Tian	1
06027	Beryllium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06028	Cadmium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06032	Cobalt	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06033	Copper	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06035	Lead	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06037	Manganese	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06038	Molybdenum	EPA 200.8 rev 5.4	1	111257050001C	5/9/11 1625	Choon Y Tian	1
06039	Nickel	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06041	Selenium	EPA 200.8 rev 5.4	1	111257050001B	5/9/11 1625	Choon Y Tian	1
06042	Silver	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06045	Thallium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06046	Tin	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06047	Titanium	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
06049	Zinc	EPA 200.8 rev 5.4	1	111257050001A	5/9/11 1625	Choon Y Tian	1
00259	Mercury	EPA 245.1 rev 3	2	111255714002	5/6/11 1048	Damary Valentin	1
05716	EPA 600 ICP Digest (tot rec)	EPA 200.7 rev 4.4	1	111265716001	5/9/11 0907	Denise K Connors	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	111257050001	5/6/11 0900	Denise K Connors	1
05714	PW/WW Hg Digest	EPA 245.1 rev 3	1	111255714002	5/5/11 1630	Nelli S Markaryan	1
01505	Bromide	EPA 300.0	1	11136196902A	5/16/11 2350	Ashley M Adams	1
01504	Fluoride	EPA 300.0	1	11136196902A	5/16/11 2350	Ashley M Adams	1
00228	Sulfate	EPA 300.0	1	11136196902A	5/16/11 2350	Ashley M Adams	1
00237	Total Cyanide (water)	EPA 335.4	1	11137102101B	5/17/11 1854	Joseph E McKenzie	1
00434	Phenols (water)	EPA 420.4	1	11131113101A	5/13/11 0909	K Robert Caulfeild- James	1
00492	Cyanide Water Distillation	EPA 335.4	2	11137102101B	5/17/11 0915	Nancy J Shoop	1
00491	Phenol Distillation (water)	EPA 420.4	1	11131113101A	5/11/11 1445	Carolyn M Mastropietro	1
08079	HEM (oil & grease)	EPA 1664A	1	11132807901A	5/12/11 0608	Valerie J Trout	1
00277	Color	SM20 2120 B	1	11125027701A	5/5/11 1840	Luz M Groff	1
00230	Sulfide	SM20 4500 S2 D	1	11131023001A	5/11/11 0830	Susan E Hibner	1
00229	Sulfite	SM20 4500 SO3 B	1	11136022901A	5/16/11 1405	Michele L Graham	1
00225	M. B. A. S.	SM20 5540 C	1	11125022502A	5/5/11 2310	Daniel S Smith	1
6277479 Trip Blank Water Sample							
10371	EPA 624 water	EPA 624	1	M111291AA	5/9/11 1139	Lauren C Temple	1

Client Name: Merck & Co., Inc. - VA

Group Number: 1245304

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	Max RPD
Batch number: M111291AA Sample number(s): 6277476-6277479								
Acrolein	N.D.	10.	ug/l	102		53-126		
Acrylonitrile	N.D.	10.	ug/l	91		61-120		
Benzene	N.D.	0.9	ug/l	104		80-121		
Bromodichloromethane	N.D.	0.7	ug/l	100		76-123		
Bromoform	N.D.	0.8	ug/l	90		63-123		
Bromomethane	N.D.	2.	ug/l	84		61-128		
Carbon Tetrachloride	N.D.	1.	ug/l	106		75-121		
Chlorobenzene	N.D.	0.8	ug/l	95		80-120		
Chloroethane	N.D.	2.	ug/l	88		61-128		
2-Chloroethyl Vinyl Ether	N.D.	2.	ug/l	90		47-128		
Chloroform	N.D.	1.	ug/l	102		80-125		
Chloromethane	N.D.	2.	ug/l	89		63-135		
Dibromochloromethane	N.D.	1.	ug/l	96		74-121		
Dichlorodifluoromethane	N.D.	2.	ug/l	79		48-120		
1,1-Dichloroethane	N.D.	1.	ug/l	103		75-130		
1,2-Dichloroethane	N.D.	1.	ug/l	100		72-138		
1,1-Dichloroethene	N.D.	0.9	ug/l	102		77-129		
trans-1,2-Dichloroethene	N.D.	1.	ug/l	100		79-125		
1,2-Dichloropropane	N.D.	1.	ug/l	99		78-121		
cis-1,3-Dichloropropene	N.D.	1.	ug/l	99		79-120		
trans-1,3-Dichloropropene	N.D.	0.6	ug/l	89		74-120		
Ethylbenzene	N.D.	0.8	ug/l	100		80-120		
Methylene Chloride	N.D.	2.	ug/l	100		77-128		
1,1,2,2-Tetrachloroethane	N.D.	1.	ug/l	92		80-120		
Tetrachloroethene	N.D.	1.	ug/l	98		77-127		
Toluene	N.D.	0.8	ug/l	98		80-120		
1,1,1-Trichloroethane	N.D.	1.	ug/l	103		74-127		
1,1,2-Trichloroethane	N.D.	1.	ug/l	96		80-120		
Trichloroethene	N.D.	1.	ug/l	101		80-120		
Trichlorofluoromethane	N.D.	2.	ug/l	94		67-124		
Vinyl Chloride	N.D.	2.	ug/l	91		62-129		
Batch number: 11125WAH625 Sample number(s): 6277476-6277478								
Acenaphthene	N.D.	0.3	ug/l	97	98	75-117	2	30

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Acenaphthylene	N.D.	0.3	ug/l	101	103	75-122	2	30
Anthracene	N.D.	0.2	ug/l	100	102	75-111	1	30
Benzidine	N.D.	20.	ug/l	66	55	16-104	17	30
Benzo(a)anthracene	N.D.	0.2	ug/l	99	101	76-117	2	30
Benzo(a)pyrene	N.D.	0.3	ug/l	105	104	74-117	1	30
Benzo(b)fluoranthene	N.D.	0.3	ug/l	101	101	73-121	0	30
Benzo(g,h,i)perylene	N.D.	0.2	ug/l	103	103	73-121	0	30
Benzo(k)fluoranthene	N.D.	0.3	ug/l	111	109	75-120	1	30
4-Bromophenyl-phenylether	N.D.	0.3	ug/l	102	102	80-112	0	30
Butylbenzylphthalate	N.D.	0.8	ug/l	98	97	76-115	1	30
Di-n-butylphthalate	N.D.	0.5	ug/l	100	97	76-114	2	30
4-Chloro-3-methylphenol	N.D.	0.3	ug/l	91	91	75-113	0	30
bis(2-Chloroethoxy)methane	N.D.	0.5	ug/l	89	87	69-128	2	30
bis(2-Chloroethyl)ether	N.D.	0.4	ug/l	97	97	72-114	0	30
bis(2-Chloroisopropyl)ether	N.D.	0.3	ug/l	99	99	87-134	0	30
2-Chloronaphthalene	N.D.	0.2	ug/l	97	73*	76-112	28	30
2-Chlorophenol	N.D.	0.3	ug/l	99	97	74-109	2	30
4-Chlorophenyl-phenylether	N.D.	0.3	ug/l	99	102	76-115	4	30
Chrysene	N.D.	0.2	ug/l	99	100	81-114	1	30
Dibenz(a,h)anthracene	N.D.	0.4	ug/l	102	103	77-127	0	30
1,2-Dichlorobenzene	N.D.	0.3	ug/l	89	88	60-111	0	30
1,3-Dichlorobenzene	N.D.	0.3	ug/l	86	90	67-110	4	30
1,4-Dichlorobenzene	N.D.	0.3	ug/l	84	90	68-111	7	30
3,3'-Dichlorobenzidine	N.D.	0.8	ug/l	74	71	45-110	5	30
2,4-Dichlorophenol	N.D.	0.3	ug/l	89	91	87-115	2	30
Diethylphthalate	N.D.	0.3	ug/l	94	95	74-113	1	30
2,4-Dimethylphenol	N.D.	0.3	ug/l	88	88	69-106	0	30
Dimethylphthalate	N.D.	1.	ug/l	83	87	52-122	5	30
4,6-Dinitro-2-methylphenol	N.D.	4.	ug/l	104	105	65-120	1	30
2,4-Dinitrophenol	N.D.	10.	ug/l	96	112	64-140	16	30
2,4-Dinitrotoluene	N.D.	0.4	ug/l	99	102	74-121	3	30
2,6-Dinitrotoluene	N.D.	0.3	ug/l	100	99	80-115	1	30
1,2-Diphenylhydrazine	N.D.	0.2	ug/l	102	103	75-114	1	30
bis(2-Ethylhexyl)phthalate	N.D.	1.	ug/l	99	99	74-118	0	30
Fluoranthene	N.D.	0.3	ug/l	103	104	73-105	0	30
Fluorene	N.D.	0.3	ug/l	101	104	74-117	3	30
Hexachlorobenzene	N.D.	1.	ug/l	106	105	75-114	1	30
Hexachlorobutadiene	N.D.	0.8	ug/l	69	70	58-116	0	30
Hexachlorocyclopentadiene	N.D.	2.	ug/l	69	70	38-133	1	30
Hexachloroethane	N.D.	0.4	ug/l	74	79	44-113	6	30
Indeno(1,2,3-cd)pyrene	N.D.	0.3	ug/l	102	102	68-118	1	30
Isophorone	N.D.	0.3	ug/l	90	90	64-105	0	30
Naphthalene	N.D.	0.2	ug/l	87	88	66-112	1	30
Nitrobenzene	N.D.	0.5	ug/l	90	91	68-110	1	30
2-Nitrophenol	N.D.	0.4	ug/l	89	91	77-120	2	30
4-Nitrophenol	N.D.	5.	ug/l	55	56	28-63	1	30
N-Nitroso-di-n-propylamine	N.D.	0.4	ug/l	101	98	68-114	4	30
N-Nitrosodimethylamine	N.D.	0.4	ug/l	69	70	44-81	1	30
N-Nitrosodiphenylamine	N.D.	0.3	ug/l	101	103	84-135	2	30

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Di-n-octylphthalate	N.D.	0.5	ug/l	110	109	70-126	1	30
Pentachlorophenol	N.D.	3.	ug/l	91	87	55-137	5	30
Phenanthrene	N.D.	0.2	ug/l	100	99	77-113	1	30
Phenol	N.D.	0.4	ug/l	52	51	34-59	1	30
Pyrene	N.D.	0.2	ug/l	100	100	76-115	0	30
1,2,4-Trichlorobenzene	N.D.	0.3	ug/l	83	85	62-113	3	30
2,4,6-Trichlorophenol	N.D.	0.7	ug/l	97	101	74-112	3	30

Batch number: 111270008A

Sample number(s): 6277476-6277478

Aldrin	N.D.	0.0020	ug/l	90	96	42-122	7	30
Alpha BHC	N.D.	0.0032	ug/l	88	96	76-130	9	30
Beta BHC	N.D.	0.0049	ug/l	94	101	77-139	7	30
Gamma BHC - Lindane	N.D.	0.0025	ug/l	93	97	76-126	4	30
Chlordane	N.D.	0.070	ug/l					
p,p-DDD	N.D.	0.0050	ug/l	90	95	66-139	5	30
p,p-DDE	N.D.	0.0050	ug/l	95	105	67-145	11	30
p,p-DDT	N.D.	0.0050	ug/l	90	105	55-124	15	30
Delta BHC	N.D.	0.0038	ug/l	94	101	72-137	7	30
Dieldrin	N.D.	0.0051	ug/l	95	105	74-125	10	30
Endosulfan I	N.D.	0.0051	ug/l	81	91	54-116	12	30
Endosulfan II	N.D.	0.011	ug/l	85	95	58-127	11	30
Endosulfan Sulfate	N.D.	0.0050	ug/l	90	105	63-140	15	30
Endrin	N.D.	0.0070	ug/l	85	90	42-132	6	30
Endrin Aldehyde	N.D.	0.020	ug/l	85	95	64-126	11	30
Heptachlor	N.D.	0.0026	ug/l	89	97	57-111	9	30
Heptachlor Epoxide	N.D.	0.0026	ug/l	99	102	70-142	3	30
PCB-1016	N.D.	0.10	ug/l					
PCB-1221	N.D.	0.30	ug/l					
PCB-1232	N.D.	0.39	ug/l					
PCB-1242	N.D.	0.10	ug/l					
PCB-1248	N.D.	0.10	ug/l					
PCB-1254	N.D.	0.10	ug/l					
PCB-1260	N.D.	0.10	ug/l					
Toxaphene	N.D.	1.0	ug/l					

Batch number: 111255714002

Sample number(s): 6277476-6277478

Mercury	N.D.	0.000046	mg/l	91		85-115		
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Batch number: 111257050001A

Sample number(s): 6277476-6277478

Antimony	N.D.	0.00030	mg/l	105		85-115		
Arsenic	N.D.	0.00095	mg/l	113		85-115		
Beryllium	N.D.	0.00013	mg/l	105		85-115		
Cadmium	N.D.	0.00020	mg/l	102		85-115		

* - Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Cobalt	N.D.	0.00010	mg/l	104	85-115
Copper	N.D.	0.00038	mg/l	103	85-115
Lead	N.D.	0.000052	mg/l	100	85-115
Manganese	N.D.	0.00040	mg/l	106	85-115
Nickel	N.D.	0.00050	mg/l	103	85-115
Silver	N.D.	0.000080	mg/l	103	85-115
Thallium	N.D.	0.00015	mg/l	97	85-115
Tin	N.D.	0.00040	mg/l	103	85-115
Titanium	N.D.	0.0052	mg/l	112	85-115
Zinc	N.D.	0.0040	mg/l	103	85-115

Batch number: 111257050001B Sample number(s): 6277476-6277478

Selenium	N.D.	0.00025	mg/l	102	85-115
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Batch number: 111257050001C Sample number(s): 6277476-6277478

Molybdenum	N.D.	0.00025	mg/l	99	85-115
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Batch number: 111257050001D Sample number(s): 6277476-6277478

Barium	N.D.	0.00053	mg/l	106	85-115
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Batch number: 111265716001 Sample number(s): 6277476-6277478

Aluminum	N.D.	0.0834	mg/l	99	85-115
Boron	N.D.	0.0138	mg/l	95	89-110
Chromium	N.D.	0.0034	mg/l	98	90-110
Iron	N.D.	0.0522	mg/l	101	90-110
Magnesium	N.D.	0.0172	mg/l	102	90-110

Batch number: 11131113101A Sample number(s): 6277476-6277478

Phenols (water)	N.D.	0.015	mg/l	97	90-110
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Batch number: 11136196902A Sample number(s): 6277476-6277478

Bromide	N.D.	0.40	mg/l	94	89-110
Fluoride	N.D.	0.080	mg/l	90	90-110
Sulfate	N.D.	0.30	mg/l	92	90-110

Batch number: 11137102101B Sample number(s): 6277476-6277478

* - Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Total Cyanide (water) N.D. 0.0050 mg/l 109 90-110

Batch number: 11125022502A Sample number(s): 6277476-6277478

M. B. A. S. N.D. 0.040 ng/l LAS M 104 83-114

Batch number: 11125027701A Sample number(s): 6277476-6277478

Color N.D. 5.0 C P units

Batch number: 11131023001A Sample number(s): 6277476-6277478

Sulfide N.D. 0.054 mg/l 94 90-110

Batch number: 11132807901A Sample number(s): 6277476-6277478

HEM (oil & grease) 1.9 J 1.4 mg/l 88 87 78-114 1 16

Batch number: 11136022901A Sample number(s): 6277476-6277478

Sulfite N.D. 1.5 mg/l 90 65-110

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
Batch number: M111291AA Sample number(s): 6277476-6277479 UNSPK: P275711									
Acrolein	103	103	40-128	0	30				
Acrylonitrile	91	90	58-124	1	30				
Benzene	109	111	83-132	2	30				
Bromodichloromethane	104	105	78-128	1	30				
Bromoform	91	91	59-129	1	30				
Bromomethane	93	92	63-134	1	30				
Carbon Tetrachloride	114	116	76-147	1	30				
Chlorobenzene	99	98	82-121	2	30				
Chloroethane	97	97	65-138	0	30				
2-Chloroethyl Vinyl Ether	0*	0*	10-172	0	30				

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Chloroform	108	109	82-132	0	30
Chloromethane	98	98	63-149	1	30
Dibromochloromethane	98	97	72-128	1	30
Dichlorodifluoromethane	90	90	53-146	1	30
1,1-Dichloroethane	110	110	79-141	0	30
1,2-Dichloroethane	104	105	75-140	1	30
1,1-Dichloroethene	111	111	85-146	0	30
trans-1,2-Dichloroethene	109	109	84-138	0	30
1,2-Dichloropropane	104	105	77-130	1	30
cis-1,3-Dichloropropene	96	95	74-113	1	30
trans-1,3-Dichloropropene	89	91	69-116	2	30
Ethylbenzene	103	103	82-124	0	30
Methylene Chloride	106	106	77-134	0	30
1,1,2,2-Tetrachloroethane	97	97	84-116	0	30
Tetrachloroethene	105	104	78-136	1	30
Toluene	103	102	84-123	0	30
1,1,1-Trichloroethane	112	113	83-137	1	30
1,1,2-Trichloroethane	100	98	85-121	3	30
Trichloroethene	106	109	86-131	3	30
Trichlorofluoromethane	106	104	73-149	2	30
Vinyl Chloride	99	102	66-146	3	30

Batch number: 111255714002

Sample number(s): 6277476-6277478 UNSPK: P277065 BKG: P277065

Mercury	104	80-120	N.D.	N.D.	0 (1)	20
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Batch number: 111257050001A

Sample number(s): 6277476-6277478 UNSPK: P277350 BKG: P277350

Antimony	98	70-130	N.D.	N.D.	0 (1)	20
Arsenic	105	70-130	0.0014 J	0.0014 J	2 (1)	20
Beryllium	105	70-130	0.00075	0.00074	2 (1)	20
Cadmium	96	70-130	0.0016	0.0013	19 (1)	20
Cobalt	103	70-130	0.0840	0.0843	0	20
Copper	103	70-130	0.0282	0.0276	2	20
Lead	105	70-130	0.00080 J	0.00079 J	1 (1)	20
Manganese	124 (2)	70-130	7.53	7.35	2	20
Nickel	104	70-130	0.0756	0.0732	3	20
Silver	99	70-130	N.D.	N.D.	0 (1)	20
Thallium	104	70-130	0.00021 J	N.D.	200* (1)	20
Tin	101	70-130	N.D.	N.D.	0 (1)	20
Titanium	103	70-130	N.D.	N.D.	0 (1)	20
Zinc	90 (2)	70-130	0.269	0.268	0	20

Batch number: 111257050001B

Sample number(s): 6277476-6277478 UNSPK: P277350 BKG: P277350

Selenium	97	70-130	0.00043 J	0.00033 J	28* (1)	20
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* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Batch number: 111257050001C		Sample number(s): 6277476-6277478 UNSPK: P277350 BKG: P277350					
Molybdenum	102	70-130		0.00065	0.00047 J	33* (1)	20
Batch number: 111257050001D		Sample number(s): 6277476-6277478 UNSPK: P277350 BKG: P277350					
Barium	108	70-130		0.0511	0.0493	3	20
Batch number: 111265716001		Sample number(s): 6277476-6277478 UNSPK: P278105 BKG: P278105					
Aluminum	97	70-130		N.D.	N.D.	0 (1)	20
Boron	97	88-111		N.D.	N.D.	0 (1)	20
Chromium	95	81-120		N.D.	N.D.	0 (1)	20
Iron	96	70-130		0.0547 J	0.0628 J	14 (1)	20
Magnesium	82 (2)	77-122		18.7	18.4	2	20
Batch number: 11131113101A		Sample number(s): 6277476-6277478 UNSPK: P279632					
Phenols (water)	93	95	90-110	2	6		
Batch number: 11136196902A		Sample number(s): 6277476-6277478 UNSPK: 6277476 BKG: 6277476					
Bromide	96	90-110		N.D.	N.D.	0 (1)	20
Fluoride	92	90-110		N.D.	N.D.	0 (1)	20
Sulfate	105	90-110		42.5	45.8	8	20
Batch number: 11137102101B		Sample number(s): 6277476-6277478 UNSPK: P278377 BKG: P278377					
Total Cyanide (water)	104	90-110		0.010	0.010	2 (1)	20
Batch number: 11125022502A		Sample number(s): 6277476-6277478 UNSPK: 6277476 BKG: 6277477					
M. B. A. S.	97	94	60-136	3	16	0.92	22
Batch number: 11125027701A		Sample number(s): 6277476-6277478 BKG: 6277476					
Color				60.0	60.0	0	20
Batch number: 11131023001A		Sample number(s): 6277476-6277478 UNSPK: P279106 BKG: P279106					

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Sulfide	105	100	50-130	5	10	N.D.	N.D.	0 (1)	5
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Batch number: 11136022901A Sample number(s): 6277476-6277478 UNSPK: P279434 BKG: P279434

Sulfite	92	94	85-103	2	5	N.D.	N.D.	0 (1)	20
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Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: EPA 624 water
Batch number: M111291AA

	1,2-Dichloroethane-d4	Fluorobenzene	4-Bromofluorobenzene
6277476	103	96	93
6277477	100	97	93
6277478	100	95	90
6277479	104	95	92
Blank	104	97	95
LCS	103	100	99
MS	104	100	100
MSD	102	101	98
Limits:	76-114	80-120	86-115

Analysis Name: Method 625
Batch number: 11125WAH625

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14	Phenol-d6
6277476	88	100	86	50
6277477	87	98	75	54
6277478	81	94	86	46
Blank	90	92	85	45
LCS	89	100	93	52
LCSD	88	100	92	51
Limits:	56-120	62-121	56-119	10-72

	2-Fluorophenol	2,4,6-Tribromophenol
6277476	74	92
6277477	76	92
6277478	70	84

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Blank	68	100
LCS	74	102
LCSD	72	105
Limits:	17-103	36-140

Analysis Name: Pesticides/PCBs in Water

Batch number: 111270008A

	Tetrachloro-m-xylene	Decachlorobiphenyl
6277476	76	61
6277477	63	44
6277478	82	89
Blank	97	95
LCS	89	88
LCSD	94	101
Limits:	38-142	44-133

* - Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

QC Comment

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

6277476 Outfall 001 24Hr Composite Water Sample

00229 Sulfite

The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.

00277 Color

Color reported is the APPARENT color. Comparison was done on the sample as received.

10334 Method 625

The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC Standards. The following analytes are accepted based on this allowance:
2-chloronaphthalene

10371 2-Chloroethyl Vinyl Ether

2-Chloroethyl vinyl ether may not be recovered if acid was used to preserve this sample.

10371 EPA 624 water

Bis-(chloromethyl)ether (BCME) was not detected in this sample based on an examination of GC/MS extracted ion current profiles at the appropriate retention time. It should be noted that BCME degrades immediately upon contact with water (the half-life in water is approximately 38 seconds.)

6277478 Field Blank Grab Water Sample

00229 Sulfite

The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.

00277 Color

Color reported is the APPARENT color. Comparison was done on the sample as received.

10334 Method 625

The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC Standards. The following analytes are accepted based on this allowance:
2-chloronaphthalene

10371 2-Chloroethyl Vinyl Ether

2-Chloroethyl vinyl ether may not be recovered if acid was used to preserve this sample.

10371 EPA 624 water

Bis-(chloromethyl)ether (BCME) was not detected in this sample based on an examination of GC/MS extracted ion current profiles at the appropriate retention time. It should be noted that BCME degrades immediately upon contact with water (the half-life in water is approximately 38 seconds.)

6277479 Trip Blank Water Sample

10371 2-Chloroethyl Vinyl Ether

2-Chloroethyl vinyl ether may not be recovered if acid was used to preserve this sample.

10371 EPA 624 water

Bis-(chloromethyl)ether (BCME) was not detected in this sample based on an examination of GC/MS extracted ion current profiles at the appropriate

retention time. It should be noted that BCME degrades immediately upon contact with water (the half-life in water is approximately 38 seconds.)

Analysis Name	Units	Method	Cas Number 6277476	Outfall	MDL
				Result	
Acrolein	ug/l	EPA 624	107-02-8	N.D.	10
Acrylonitrile	ug/l	EPA 624	107-13-1	N.D.	10
Benzene	ug/l	EPA 624	71-43-2	N.D.	0.9
Bromodichloromethane	ug/l	EPA 624	75-27-4	N.D.	0.7
Bromoform	ug/l	EPA 624	75-25-2	N.D.	0.8
Bromomethane	ug/l	EPA 624	74-83-9	N.D.	2
Carbon Tetrachloride	ug/l	EPA 624	56-23-5	N.D.	1
Chlorobenzene	ug/l	EPA 624	108-90-7	N.D.	0.8
Chloroethane	ug/l	EPA 624	75-00-3	N.D.	2
2-Chloroethyl Vinyl Ether	ug/l	EPA 624	110-75-8	N.D.	2
Chloroform	ug/l	EPA 624	67-66-3	N.D.	1
Chloromethane	ug/l	EPA 624	74-87-3	N.D.	2
Dibromochloromethane	ug/l	EPA 624	124-48-1	N.D.	1
Dichlorodifluoromethane	ug/l	EPA 624	75-71-8	N.D.	2
1,1-Dichloroethane	ug/l	EPA 624	75-34-3	N.D.	1
1,2-Dichloroethane	ug/l	EPA 624	107-06-2	N.D.	1
1,1-Dichloroethene	ug/l	EPA 624	75-35-4	N.D.	0.9
trans-1,2-Dichloroethene	ug/l	EPA 624	156-60-5	N.D.	1
1,2-Dichloropropane	ug/l	EPA 624	78-87-5	N.D.	1
cis-1,3-Dichloropropene	ug/l	EPA 624	10061-01-5	N.D.	1
trans-1,3-Dichloropropene	ug/l	EPA 624	10061-02-6	N.D.	0.6
Ethylbenzene	ug/l	EPA 624	100-41-4	N.D.	0.8
Methylene Chloride	ug/l	EPA 624	75-09-2	N.D.	2
1,1,2,2-Tetrachloroethane	ug/l	EPA 624	79-34-5	N.D.	1
Tetrachloroethene	ug/l	EPA 624	127-18-4	N.D.	1
Toluene	ug/l	EPA 624	108-88-3	N.D.	0.8
1,1,1-Trichloroethane	ug/l	EPA 624	71-55-6	N.D.	1
1,1,2-Trichloroethane	ug/l	EPA 624	79-00-5	N.D.	1
Trichloroethene	ug/l	EPA 624	79-01-6	N.D.	1
Trichlorofluoromethane	ug/l	EPA 624	75-69-4	N.D.	2
Vinyl Chloride	ug/l	EPA 624	75-01-4	N.D.	2
Acenaphthene	ug/l	EPA 625	83-32-9	N.D.	0.4
Acenaphthylene	ug/l	EPA 625	208-96-8	N.D.	0.4
Anthracene	ug/l	EPA 625	120-12-7	N.D.	0.2
Benzidine	ug/l	EPA 625	92-87-5	N.D.	24
Benzo(a)anthracene	ug/l	EPA 625	56-55-3	N.D.	0.2
Benzo(a)pyrene	ug/l	EPA 625	50-32-8	N.D.	0.4
Benzo(b)fluoranthene	ug/l	EPA 625	205-99-2	N.D.	0.4
Benzo(g,h,i)perylene	ug/l	EPA 625	191-24-2	N.D.	0.2
Benzo(k)fluoranthene	ug/l	EPA 625	207-08-9	N.D.	0.4
4-Bromophenyl-phenylether	ug/l	EPA 625	101-55-3	N.D.	0.4
Butylbenzylphthalate	ug/l	EPA 625	85-68-7	N.D.	0.9
Di-n-butylphthalate	ug/l	EPA 625	84-74-2	N.D.	0.6
4-Chloro-3-methylphenol	ug/l	EPA 625	59-50-7	N.D.	0.4
bis(2-Chloroethoxy)methane	ug/l	EPA 625	111-91-1	N.D.	0.6
bis(2-Chloroethyl)ether	ug/l	EPA 625	111-44-4	N.D.	0.5
bis(2-Chloroisopropyl)ether	ug/l	EPA 625	39638-32-9	N.D.	0.4
2-Chloronaphthalene	ug/l	EPA 625	91-58-7	N.D.	0.2

2-Chlorophenol	ug/l	EPA 625	95-57-8	N.D.	0.4
4-Chlorophenyl-phenylether	ug/l	EPA 625	7005-72-3	N.D.	0.4
Chrysene	ug/l	EPA 625	218-01-9	N.D.	0.2
Dibenz(a,h)anthracene	ug/l	EPA 625	53-70-3	N.D.	0.5
1,2-Dichlorobenzene	ug/l	EPA 625	95-50-1	N.D.	0.4
1,3-Dichlorobenzene	ug/l	EPA 625	541-73-1	N.D.	0.4
1,4-Dichlorobenzene	ug/l	EPA 625	106-46-7	N.D.	0.4
3,3'-Dichlorobenzidine	ug/l	EPA 625	91-94-1	N.D.	0.9
2,4-Dichlorophenol	ug/l	EPA 625	120-83-2	N.D.	0.4
Diethylphthalate	ug/l	EPA 625	84-66-2	1 J	0.4
2,4-Dimethylphenol	ug/l	EPA 625	105-67-9	N.D.	0.4
Dimethylphthalate	ug/l	EPA 625	131-11-3	N.D.	1
4,6-Dinitro-2-methylphenol	ug/l	EPA 625	534-52-1	N.D.	5
2,4-Dinitrophenol	ug/l	EPA 625	51-28-5	N.D.	12
2,4-Dinitrotoluene	ug/l	EPA 625	121-14-2	N.D.	0.5
2,6-Dinitrotoluene	ug/l	EPA 625	606-20-2	N.D.	0.4
1,2-Diphenylhydrazine	ug/l	EPA 625	122-66-7	N.D.	0.2
bis(2-Ethylhexyl)phthalate	ug/l	EPA 625	117-81-7	N.D.	1
Fluoranthene	ug/l	EPA 625	206-44-0	N.D.	0.4
Fluorene	ug/l	EPA 625	86-73-7	N.D.	0.4
Hexachlorobenzene	ug/l	EPA 625	118-74-1	N.D.	1
Hexachlorobutadiene	ug/l	EPA 625	87-68-3	N.D.	0.9
Hexachlorocyclopentadiene	ug/l	EPA 625	77-47-4	N.D.	2
Hexachloroethane	ug/l	EPA 625	67-72-1	N.D.	0.5
Indeno(1,2,3-cd)pyrene	ug/l	EPA 625	193-39-5	N.D.	0.4
Isophorone	ug/l	EPA 625	78-59-1	N.D.	0.4
Naphthalene	ug/l	EPA 625	91-20-3	N.D.	0.2
Nitrobenzene	ug/l	EPA 625	98-95-3	N.D.	0.6
2-Nitrophenol	ug/l	EPA 625	88-75-5	N.D.	0.5
4-Nitrophenol	ug/l	EPA 625	100-02-7	N.D.	6
N-Nitroso-di-n-propylamine	ug/l	EPA 625	621-64-7	N.D.	0.5
N-Nitrosodimethylamine	ug/l	EPA 625	62-75-9	N.D.	0.5
N-Nitrosodiphenylamine	ug/l	EPA 625	86-30-6	N.D.	0.4
Di-n-octylphthalate	ug/l	EPA 625	117-84-0	N.D.	0.6
Pentachlorophenol	ug/l	EPA 625	87-86-5	N.D.	4
Phenanthrene	ug/l	EPA 625	85-01-8	N.D.	0.2
Phenol	ug/l	EPA 625	108-95-2	3 J	0.5
Pyrene	ug/l	EPA 625	129-00-0	N.D.	0.2
1,2,4-Trichlorobenzene	ug/l	EPA 625	120-82-1	N.D.	0.4
2,4,6-Trichlorophenol	ug/l	EPA 625	88-06-2	N.D.	0.8
Aldrin	ug/l	EPA 608	309-00-2	N.D.	0.0027
Alpha BHC	ug/l	EPA 608	319-84-6	N.D.	0.0044
Beta BHC	ug/l	EPA 608	319-85-7	N.D.	0.0067
Gamma BHC - Lindane	ug/l	EPA 608	58-89-9	N.D.	0.0034
Chlordane	ug/l	EPA 608	57-74-9	N.D.	0.096
p,p-DDD	ug/l	EPA 608	72-54-8	N.D.	0.0068
p,p-DDE	ug/l	EPA 608	72-55-9	N.D.	0.0068
p,p-DDT	ug/l	EPA 608	50-29-3	N.D.	0.0068
Delta BHC	ug/l	EPA 608	319-86-8	N.D.	0.0052
Dieldrin	ug/l	EPA 608	60-57-1	N.D.	0.0070
Endosulfan I	ug/l	EPA 608	959-98-8	N.D.	0.0070

Endosulfan II	ug/l	EPA 608	33213-65-9	N.D.	0.015
Endosulfan Sulfate	ug/l	EPA 608	1031-07-8	N.D.	0.0068
Endrin	ug/l	EPA 608	72-20-8	N.D.	0.0096
Endrin Aldehyde	ug/l	EPA 608	7421-93-4	N.D.	0.027
Heptachlor	ug/l	EPA 608	76-44-8	N.D.	0.0036
Heptachlor Epoxide	ug/l	EPA 608	1024-57-3	N.D.	0.0036
PCB-1016	ug/l	EPA 608	12674-11-2	N.D.	0.14
PCB-1221	ug/l	EPA 608	11104-28-2	N.D.	0.41
PCB-1232	ug/l	EPA 608	11141-16-5	N.D.	0.53
PCB-1242	ug/l	EPA 608	53469-21-9	N.D.	0.14
PCB-1248	ug/l	EPA 608	12672-29-6	N.D.	0.14
PCB-1254	ug/l	EPA 608	11097-69-1	N.D.	0.14
PCB-1260	ug/l	EPA 608	11096-82-5	N.D.	0.14
Toxaphene	ug/l	EPA 608	8001-35-2	N.D.	1.4
Aluminum	mg/l	EPA 200.7 rev 4.4	7429-90-5	N.D.	0.0834
Boron	mg/l	EPA 200.7 rev 4.4	7440-42-8	N.D.	0.0138
Chromium	mg/l	EPA 200.7 rev 4.4	7440-47-3	N.D.	0.0034
Iron	mg/l	EPA 200.7 rev 4.4	7439-89-6	2.28	0.0522
Magnesium	mg/l	EPA 200.7 rev 4.4	7439-95-4	11.8	0.0172
Antimony	mg/l	EPA 200.8 rev 5.4	7440-36-0	N.D.	0.00030
Arsenic	mg/l	EPA 200.8 rev 5.4	7440-38-2	N.D.	0.00095
Barium	mg/l	EPA 200.8 rev 5.4	7440-39-3	0.0337	0.00053
Beryllium	mg/l	EPA 200.8 rev 5.4	7440-41-7	N.D.	0.00013
Cadmium	mg/l	EPA 200.8 rev 5.4	7440-43-9	N.D.	0.00020
Cobalt	mg/l	EPA 200.8 rev 5.4	7440-48-4	0.00022 J	0.00010
Copper	mg/l	EPA 200.8 rev 5.4	7440-50-8	0.0058	0.00038
Lead	mg/l	EPA 200.8 rev 5.4	7439-92-1	0.000075 J	0.000052
Manganese	mg/l	EPA 200.8 rev 5.4	7439-96-5	0.0238	0.00040
Molybdenum	mg/l	EPA 200.8 rev 5.4	7439-98-7	0.00035 J	0.00025
Nickel	mg/l	EPA 200.8 rev 5.4	7440-02-0	0.0015 J	0.00050
Selenium	mg/l	EPA 200.8 rev 5.4	7782-49-2	N.D.	0.00025
Silver	mg/l	EPA 200.8 rev 5.4	7440-22-4	N.D.	0.000080
Thallium	mg/l	EPA 200.8 rev 5.4	7440-28-0	N.D.	0.00015
Tin	mg/l	EPA 200.8 rev 5.4	7440-31-5	N.D.	0.00040
Titanium	mg/l	EPA 200.8 rev 5.4	7440-32-6	N.D.	0.0052
Zinc	mg/l	EPA 200.8 rev 5.4	7440-66-6	0.0086 J	0.0040
Mercury	mg/l	EPA 245.1 rev 3	7439-97-6	N.D.	0.000046
Bromide	mg/l	EPA 300.0	24959-67-9	N.D.	2.0
Fluoride	mg/l	EPA 300.0	16984-48-8	N.D.	0.40
Sulfate	mg/l	EPA 300.0	14808-79-8	42.5	1.5
Total Cyanide (water)	mg/l	EPA 335.4	57-12-5	0.0094 J	0.0050
Phenols (water)	mg/l	EPA 420.4	n.a.	N.D.	0.015
HEM (oil & grease)	mg/l	EPA 1664A	n.a.	3.1 J	1.4
Color	C P units	SM20 2120 B	n.a.	60.0	5.0
Sulfide	mg/l	SM20 4500 S2 D	18496-25-8	N.D.	0.054
Sulfite	mg/l	SM20 4500 SO3 B	14265-45-3	N.D.	1.5
M. B. A. S.	mg/l LAS MW 320	SM20 5540 C	n.a.	0.049 J	0.040

N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.2	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.8	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	1	n.a.	n.a.
N.D.	4	n.a.	n.a.
N.D.	11	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.2	n.a.	n.a.
N.D.	1	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	1	n.a.	n.a.
N.D.	0.8	n.a.	n.a.
N.D.	2	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.2	n.a.	n.a.
N.D.	0.5	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	5	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.5	n.a.	n.a.
N.D.	3	n.a.	n.a.
N.D.	0.2	n.a.	n.a.
N.D.	0.4	n.a.	n.a.
N.D.	0.2	n.a.	n.a.
N.D.	0.3	n.a.	n.a.
N.D.	0.7	n.a.	n.a.
N.D.	0.0022	n.a.	n.a.
N.D.	0.0035	n.a.	n.a.
N.D.	0.0054	n.a.	n.a.
N.D.	0.0027	n.a.	n.a.
N.D.	0.077	n.a.	n.a.
N.D.	0.0055	n.a.	n.a.
N.D.	0.0055	n.a.	n.a.
N.D.	0.0055	n.a.	n.a.
N.D.	0.0042	n.a.	n.a.
N.D.	0.0056	n.a.	n.a.
N.D.	0.0056	n.a.	n.a.

N.D.	0.012	n.a.	n.a.
N.D.	0.0055	n.a.	n.a.
N.D.	0.0077	n.a.	n.a.
N.D.	0.022	n.a.	n.a.
N.D.	0.0028	n.a.	n.a.
N.D.	0.0028	n.a.	n.a.
N.D.	0.11	n.a.	n.a.
N.D.	0.33	n.a.	n.a.
N.D.	0.43	n.a.	n.a.
N.D.	0.11	n.a.	n.a.
N.D.	0.11	n.a.	n.a.
N.D.	0.11	n.a.	n.a.
N.D.	0.11	n.a.	n.a.
N.D.	1.1	n.a.	n.a.
N.D.	0.0834	n.a.	n.a.
N.D.	0.0138	n.a.	n.a.
N.D.	0.0034	n.a.	n.a.
N.D.	0.0522	n.a.	n.a.
N.D.	0.0172	n.a.	n.a.
N.D.	0.00030	n.a.	n.a.
N.D.	0.00095	n.a.	n.a.
N.D.	0.00053	n.a.	n.a.
N.D.	0.00013	n.a.	n.a.
N.D.	0.00020	n.a.	n.a.
N.D.	0.00010	n.a.	n.a.
N.D.	0.00038	n.a.	n.a.
N.D.	0.000052	n.a.	n.a.
N.D.	0.00040	n.a.	n.a.
N.D.	0.00025	n.a.	n.a.
N.D.	0.00050	n.a.	n.a.
N.D.	0.00025	n.a.	n.a.
N.D.	0.000080	n.a.	n.a.
N.D.	0.00015	n.a.	n.a.
N.D.	0.00040	n.a.	n.a.
N.D.	0.0052	n.a.	n.a.
N.D.	0.0040	n.a.	n.a.
N.D.	0.000046	n.a.	n.a.
N.D.	0.40	n.a.	n.a.
0.11	0.080	n.a.	n.a.
N.D.	0.30	n.a.	n.a.
N.D.	0.0050	n.a.	n.a.
N.D.	0.015	n.a.	n.a.
2.7 J	1.4	n.a.	n.a.
N.D.	5.0	n.a.	n.a.
N.D.	0.054	n.a.	n.a.
N.D.	1.5	n.a.	n.a.
N.D.	0.040	n.a.	n.a.

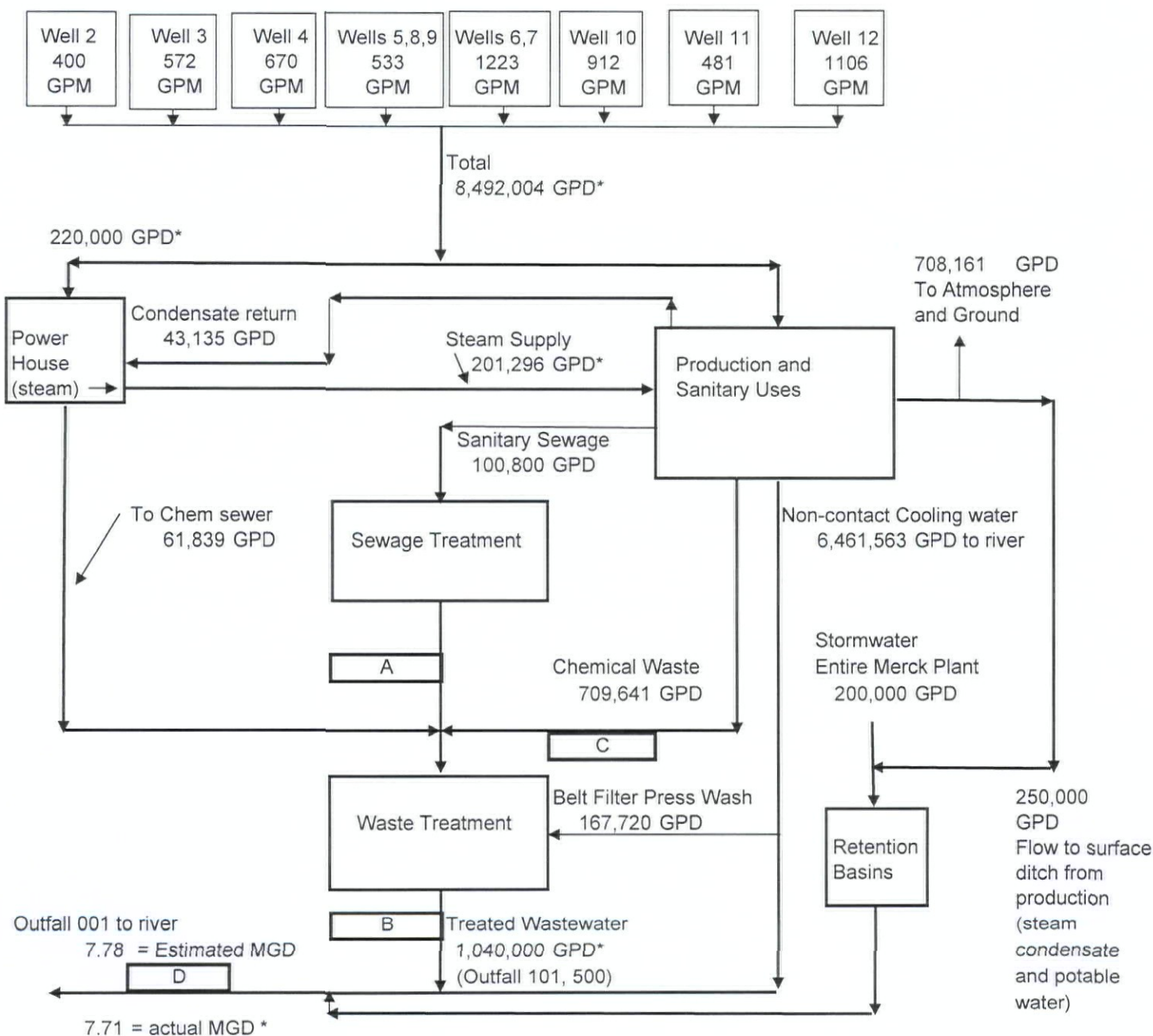
NPDES APPLICATION FORM 2C

Attachment 2

Merck Sharp & Dohme Corp. – Stonewall Plant

Water Balance

Attachment 1
Form 2C, Part II.A
Merck - Stonewall Plant Water Balance



* Basis: Measured flows from Jan. 1, 2010 to Dec. 31, 2010

Flows:

- (A) = From correspondence dated 1/20/04, Merck identified the design flow at this location as 0.150 MGD [this volume is included in (B)]. This is the monitoring location for TRC-Contact compliance.
- (B) = This is Outfall 101. From correspondence dated 1/20/04, Merck identified the design flow at this location as 1.2 MGD.
- (C) = Flow includes cyanide destruction system (RE516, RE515, RE519, RE520, ST1681)
- (D) = Outfall 001 = From correspondence dated 12/19/03, Merck identified the 95th percentile flow over a five year period of the non-contact cooling water and surface ditch as 9.66 MGD. The calculated flow at Outfall 001 is then 10.86 MGD (1.2 + 9.66). This is the monitoring location for TRC-Effluent compliance.

11.96

NPDES APPLICATION FORM 2C

Attachment 3

Merck Sharp & Dohme Corp. – Stonewall Plant

Wastewater Treatment Plant Description

2.0 PROCESS DESCRIPTION

2.1 General

The plant consists of the following unit processes:

- Equalization and neutralization - tanks/basins and acid and base addition capability at the WWTP influent (existing)
- Activated sludge system - including aeration basins, un-aerated basins with mixers, mixed liquor recycle pumps, optional methanol feed in the lagging anoxic basins, air blowers, clarifiers and sludge pumping facilities
- Belt filter presses
- Trickling filters (optional)
- Sludge dryer
- Dechlorination System

In addition to the above treatment processes, a separate package activated sludge system is provided to treat the plant's sanitary waste (see Section 6).

2.2 System Descriptions

The following is a brief description of the existing treatment system unit processes.

- Equalization to dampen fluctuations of waste flow, concentration, temperature, and pH.
- Neutralization to adjust the pH of the wastewater treatment plant influent..
- Sanitary waste treatment plant digests the sanitary waste and disinfects the treated wastewater prior to discharge to the head of the industrial treatment plant.
- Activated sludge system is provided for biological degradation of the organics and ammonia in the waste stream and denitrification
- Clarification is provided to remove solids from the aeration tank mixed liquors.
- Ferric chloride addition system for the clarified wastewater effluent from the activated sludge system for the chemical precipitation of phosphorous.
- Trickling filters (normally bypassed) are available for further biological treatment if needed.
- Final clarifiers provide further clarification of the treated wastewater prior to discharge to the river.
- Belt filter presses are provided to dewater the sludge. A polymer feed system is supplied to aid in dewatering.
- Sludge dryer dries the sludge, which is land filled offsite.
- A sulfur dioxide (gas) based dechlorination system is used to achieve compliance limits for total residual chlorine in the final plant effluent (outfall number 001).

2.3 Process Description

The Merck - Stonewall plant wastewater treatment plant (WWTP) design average flow rate is 1.2 MGD. Process waste streams are routed to the WWTP via the plant chemical sewer network. Waste entering the treatment plant may be directed to a 0.5-MG in-ground equalization basin, TA-100. Under normal operations, TA-100 is bypassed. The influent flow bypassing TA-100 or the effluent from TA-100 flows through a dual contained chemical sewer pipe where flow, where pH and temperature are monitored. The pH may be adjusted in the pipe by adding phosphoric acid, 23 % caustic, or magnesium hydroxide. About 5-10% of the influent to the WWTP is sanitary waste; this waste enters the sanitary treatment plant (STP) for extended aeration treatment. Effluent from the STP is disinfected with hypochlorite (alternatively with chlorine) and routed to influent of the industrial wastewater treatment plant (WWTP). The wastewater from the drum washing area, drum storage pad and glass crusher flows by gravity to a 1,700 gal lift station (No. 1) equipped with 2 pumps and 3 level switches. At the high level the lead pump is activated and the wastewater is pumped in chem. sewer line upstream of the communitor/bar screen. If the level continues to rise, the second level switch activates the second pump. If the level exceeds the high-high stage, an audible alarm is triggered in the control room for immediate operator action.

This combined flow entering the WWTP is sampled continuously with an ISCO composite sampler. A 9" Parshall flume and a manually cleaned bar screen are positioned in the influent channel. Flow can then be routed to two 1-MG tanks, TA-120 & TA-121, via lift station TA-115 or to the interim EQ basin (TA 801-A). All of these tanks are utilized to provide hydraulic and waste (concentration) equalization of the influent stream prior to it entering the activated sludge system.

The heart of the treatment system is the activated sludge process, which is composed of two treatment trains of three basins that hold 0.75 MG each. The lead basin in each train is partitioned into anoxic zone (0.375 MG un-aerated segment with mixers) followed by an aerated zone (0.375 MG). The intermediate basin (0.75 MG) remains completely aerated. The lag basin in each train is subdivided in three equal zones (0.25 MG each). The first zone is aerated and is equipped with a mixed liquor recycle pump, at its end, that returns mixed liquor, at a rate 3 to 4X of the influent flow plus RAS flow, back to the lead basin anoxic zone influent. The remainder of the mixed liquors enter in the next zone which is well mixed but not aerated; based on the nitrates present at the influent methanol (optional) can be added to this secondary anoxic zone. The last part of the lag basin is aerated from where the mixed liquors go the secondary clarifiers. Activated sludge is a biodegradation method that employs naturally occurring aerobic bacteria to break down, or consume chemicals in the waste stream. Anoxic zones help certain bacteria, prevalent in the activated sludge, use oxygen from the nitrates/nitrites to degrade the carbonaceous matter and forming nitrogen thereby reducing the nitrogen load in the treated wastewater. Factory wastes are mainly carbon and nitrogen compounds, including solvents and fermentation media constituents; most of these compounds are biodegradable except for some complex fermentation media constituents. Aeration is achieved with a coarse

bubble diffuser system that is supplied air by four 700 hp centrifugal compressors. In the anoxic zones where there is no aeration, adequate mixing is provided to keep the mixed liquors suspended. Process monitoring includes on-line instruments to monitor dissolved oxygen concentration, pH, and temperature. The system is controlled by maintaining a constant solids retention time (SRT). Surface foam is automatically sensed and dispersed by an automatic defoamer addition system.

Effluent from the aeration basins flows to two circular clarifiers. The settled sludge is returned back to the aeration basins (RAS) and/or removed from the system (WAS). Clarified effluent passes through a small mixing chamber – at the Kennison nozzle-equipped with a high intensity mixer. Ferric chloride is metered in this chamber at a rate proportional to the amount of ortho (reactive) phosphorous present in the effluent. Ferric chloride is highly acidic and provisions are made in the system to meter in caustic to maintain pH closed to neutral. The chemically treated effluent can be routed to a lift station that delivers the flow to two trickling filters; however the trickling filters are normally bypassed. They are a holdover from the treatment system prior to construction of the activated sludge system in the early 1980s. Since that time, almost all available BOD reduction occurs in aeration, leaving little to be done by the trickling filters. The filters remain available for use if and when additional BOD removal is required. The stream bypassing or exiting the trickling filters enters two final clarifiers. All solids from these units are wasted from the system and are pumped to the spare sludge storage (aeration) basin. The effluent from the final clarifiers (Outfall 101) is sampled continuously with an ISCO sampler. The effluent is then combined with flows from the surface ditch system and noncontact cooling water (Outfall 001) and is routed through a monitoring station, which includes an ISCO composite sampler, pH probes, temperature monitors, a turbidity meter, and an 18" Parshall flume to measure flow prior to discharging to the South Fork of the Shenandoah River. The Parshall flume is constructed of fiberglass reinforced plastic. It has two methods of level measurement: a Biff float mechanism and an ISCO bubbler tube. Both devices are calibrated annually by simulating signals and verifying that the recording/indicating instruments show the proper deflection.

Waste sludge is stored in spare aeration basins and in the sludge basins prior to being pumped to two belt filter presses. Flocculant is typically a cationic polymer and sludge cake exiting the press ranges from 8 – 12% solids. The sludge cake is routed to a storage hopper and then pumped to a non-contact steam dryer where sludge is dried to about 95% solids. Dry sludge is shipped to an off-site landfill.

2.4 Flow Diagram

A plot plan of the Stonewall Plant Wastewater Treatment Facility is shown on Figure 2.4-1.

2.5 Design Criteria

The following is a summary of the design criteria for the major equipment of each unit process.

TA-100

Interim Contingency Equalization

No. of tanks	1
Capacity (gal.)	490,000
Diameter (ft.)	70
Side water depth (ft.)	17
Hydraulic retention time (hr.)	9.8
Mixer horsepower (hp)	30
Power Level (hp/mg)	94

GR-101

Comminutor/Bar Screen

No. of Units	1
Capacity (GPM)	2292
Comminutor horsepower (hp)	5

TA-115

Pump well tank

No. of tanks	1
Capacity (gal.)	30,0000
Diameter (ft.)	20'
Side water depth (ft.)	13.2'

TA-120 and TA-121

Equalization tanks

No. of tanks	2
Capacity (gal.) (ea.)	1,000,000
Diameter (ft.)	56
Side water depth (ft.)	56
Hydraulic retention time (hr.)	40

Chemical Sewer Pipe

Neutralization:	H ₃ PO ₄ , Mg(OH) ₂
Nitrogen:	NH ₃ Water
Temperature:	Rosemont 0-50°
PH:	Rosemont 2-12
Flow:	Up to 3.3 MGD Parshall Flume

LIFT STATION No. 1

No. of Tanks	1
Tank Capacity	1,700 gal
No. of Pumps	2 – Flygt 3085 Pumps
Pump Capacity	75 GPM @ 28 Feet Head
No. of Level Switches	3 (High, High-High and Alarm)

ACTIVATED SLUDGE BASINS

No. of Tanks	6 (normally 3 in use)
--------------	-----------------------

Capacity (gal.)	750,000
Depth (ft.)	29.5'
Dimensions (ft.)	177' x 116'
Hydraulic Retention Time (hr.)	75

SLUDGE STORAGE BASINS

No. of Tanks	2 (unused activated basins available)
Capacity (gal.)	750,000
Depth (ft.)	29.5'
Dimensions (ft.)	177' x 116'

INTERIM EQ BASIN

No. of Tanks	1
Capacity (gal.)	750,000
Depth (ft.)	29.5'
Dimensions (ft.)	177' x 116'
Hydraulic Retention Time (hr.)	15

SECONDARY SEDIMENTATION

Sedimentation basins

No. of tanks	2
Capacity (gal.)	250,000
Diameter (ft.)	55
Side water depth (ft.)	14
Overflow rate (gpd/sq.ft.)	825
Weir loading rate (gpd/lin.ft.)	11,350

CENTRIFUGAL COMPRESSORS

No. of compressors	4
Design capacity/unit (scfm)	7,500
Design discharge pressure (psig)	29.2
Motor horsepower (hp)	700

SECONDARY CLARIFICATION

Secondary clarification	
No. of tanks	2
Effective surface area/tank (sq.ft.)	1,250
Capacity/tank (gal.)	94,000

Detention time @ avg. flow (hr.)	2.3
Overflow rate @ avg. flow (gal./sq.ft./day)	784

SLUDGE RAKE ARM

MECHANISMS

No. of units/tank	1
Drive horsepower (hp)	1
Design torque (ft. lbs.)	50,000
Peak torque (ft. lbs.)	100,000

RETURN ACTIVATED SLUDGE

PUMPS

No. of units	2
Type	Helical screw centrifugal
Rated capacity (gpm)	450
TDH @ rated capacity (ft.)	20
Motor horsepower (hp)	7.5
<u>WASTE ACTIVATED SLUDGE</u>	
<u>PUMPS</u>	
No. of units	2
Type	Helical screw centrifugal
Rated capacity (gpm)	300
TDH @ rated capacity (ft.)	40
Motor horsepower (hp)	7.5
<u>FERRIC CHLORIDE DOSING</u>	
<u>SYSTEM</u>	
<u>A) Pumps</u>	
No of units	2
Flow range (GPH)	0 – 19 GPH
<u>B) Mixer</u>	
No. of units	1
Rated HP and RPM	2 HP and 124 RPM
<u>TRICKLING FILTERS (NOT IN</u>	
<u>SERVICE)</u>	
No. of Units	
Size (ft. dia.)	2
Depth (ft.)	153
Media	4
<u>TRICKLING FILTERS ROTARY</u>	
<u>DISTRIBUTOR</u>	
No. of Units	
Size (ft. dia.)	2
Capacity (gpm)	153
<u>TRICKLING FILTERS WET WELL</u>	
<u>PUMPS</u>	
No. of Units	
Type	2
Rated Capacity (gpm)	Centrifugal (wet well)
TDH @ rated Capacity (ft.)	4300
Motor Horsepower (hp)	19
	25
<u>POLYMER FEED SYSTEM</u>	
<u>A) Polymer storage tank</u>	
Volume (gal.)	1500
<u>B) Polymer feed pumps</u>	
No. of units	2
Type	Diaphragm, positive

Rated capacity (gpm)	displacement 0.33-6.7
TDH @ rated capacity (psig)	50
Motor horsepower (hp)	2
C) Polymer supply pump	
No. of units	1
Rated capacity (gpm)	50
TDH @ rated capacity (psig)	50
Motor horsepower (hp)	3

BELT FILTER PRESSES

No. of units	2
Hydraulic capacity/filter (with recycle) (gpm)	200
Solid input (lbs./hr.)	727
Solids capture (%)	95-99
Cake consistency (% solids)	8-10

SULFUR DIOXIDE

DECHLORINATION SYSTEM

No. of units	1
Primary System – SO ₂ delivery	0 – 100 lbs/day
Type of Control	Manual
Vacuum system eductor	From plant well water system

Sanitary Treatment Plant

See Section 6.3.

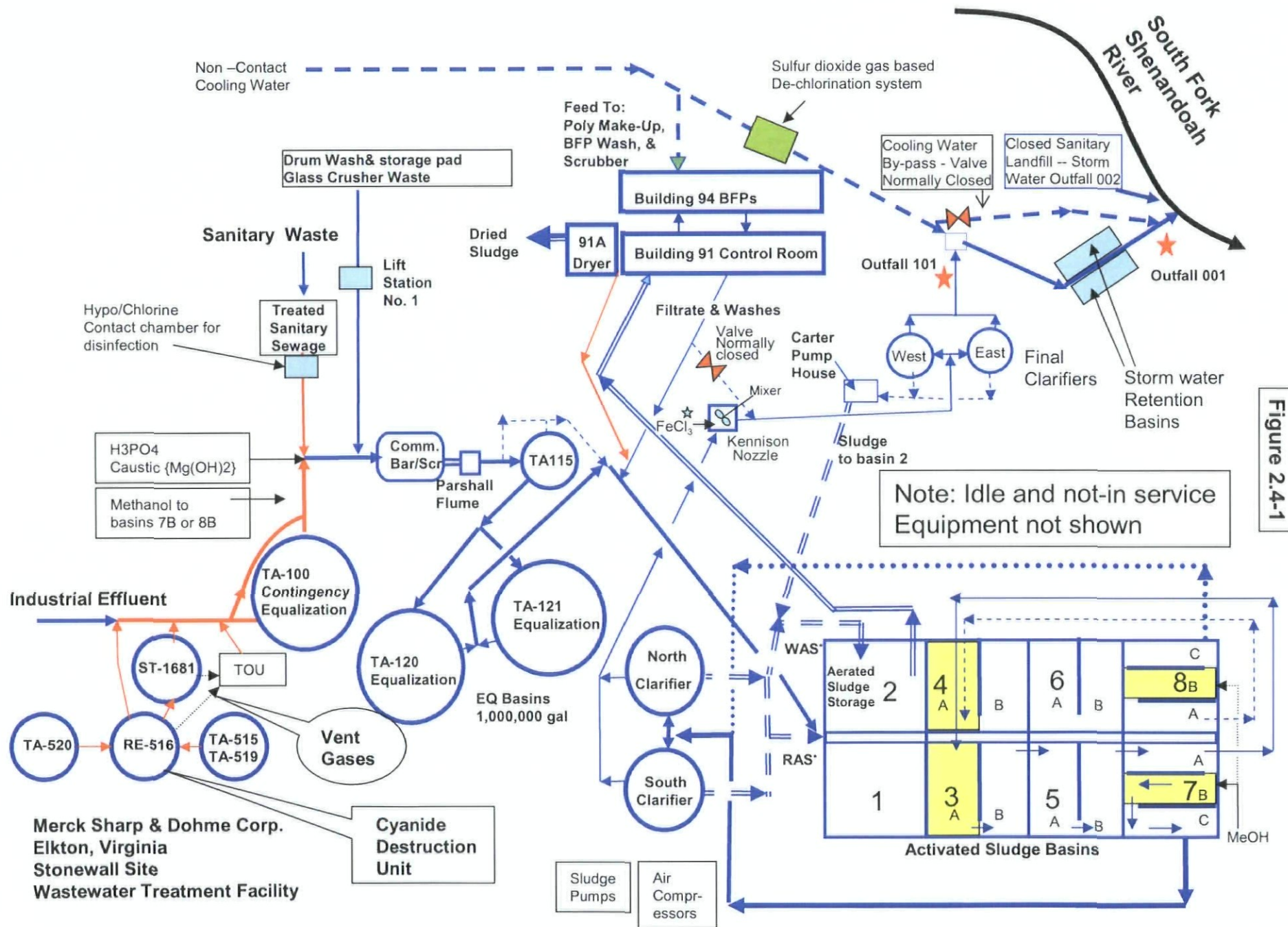


Figure 2.4-1

NPDES APPLICATION FORM 2C

Attachment 4

Merck Sharp & Dohme Corp. – Stonewall Plant

MSDS's for Cooling Water Additives



Material Safety Data Sheet

The Dow Chemical Company

Product Name: DOWFROST* Heat Transfer Fluid

Issue Date: 11/05/2007
Print Date: 06 Nov 2007

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
DOWFROST* Heat Transfer Fluid

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview

Color: Colorless

Physical State: Liquid

Odor: Characteristic

Hazards of product:

No significant immediate hazards for emergency response are known.

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause slight temporary eye irritation. Corneal injury is unlikely.

Skin Contact: Prolonged contact is essentially nonirritating to skin. Repeated contact may cause flaking and softening of skin.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Mist may cause irritation of upper respiratory tract (nose and throat).

* Indicates a Trademark

Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Effects of Repeated Exposure: In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

3. Composition Information

Component	CAS #	Amount
Propylene glycol	57-55-6	> 95.0 %
Dipotassium hydrogen phosphate	7758-11-4	< 3.0 %
Deionized water	7732-18-5	< 3.0 %

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: No emergency medical treatment necessary.

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. Recover spilled material if possible. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: No special precautions required. Keep container closed. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Do not store in: Galvanized steel. Opened or unlabeled containers. Store in original unopened container. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your Dow sales or customer service contact.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Propylene glycol	WEEL	TWA Aerosol.	10 mg/m3

Personal Protection

Eye/Face Protection: Use safety glasses.

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid
Color	Colorless
Odor	Characteristic
Flash Point - Closed Cup	104 °C (219 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i> (based on major component), Propylene glycol
Flammable Limits In Air	Lower: 2.6 %(V) <i>Literature</i> Propylene glycol Upper: 12.5 %(V) <i>Literature</i> Propylene glycol
Autoignition Temperature	371 °C (700 °F) <i>Literature</i> Propylene glycol
Vapor Pressure	2.2 mmHg <i>Literature</i>
Boiling Point (760 mmHg)	152 °C (306 °F) <i>Literature</i>
Vapor Density (air = 1)	>1.0 <i>Literature</i>
Specific Gravity (H2O = 1)	1.05 20 °C/20 °C <i>Literature</i>
Freezing Point	supercools
Melting Point	Not applicable to liquids
Solubility in Water (by weight)	100 % <i>Literature</i>
pH	10.0 <i>Literature</i>
Kinematic Viscosity	43.4 cSt @ 20 °C <i>Literature</i>

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Generation of gas during decomposition can cause pressure in closed systems. Avoid direct sunlight or ultraviolet sources.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers. Organic acids.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, Rat, female 20,300 mg/kg

Skin Absorption

For similar material(s): LD50, Rabbit > 10,000 mg/kg

Repeated Dose Toxicity

In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

Chronic Toxicity and Carcinogenicity

Similar formulations did not cause cancer in laboratory animals.

Developmental Toxicity

For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity

For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Genetic Toxicology

In vitro genetic toxicity studies were negative. For the major component(s): Animal genetic toxicity studies were negative.

12. Ecological Information**CHEMICAL FATE****Movement & Partitioning**

For the major component(s): Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability

For the major component(s): Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

ECOTOXICITY

For the major component(s): Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

14. Transport Information**DOT Non-Bulk**

NOT REGULATED

DOT Bulk

NOT REGULATED

IMDG

NOT REGULATED

ICAO/IATA

NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	No
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Propylene glycol	57-55-6	> 95.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	0	1	0

Recommended Uses and Restrictions

Intended as a heat transfer fluid for closed-loop systems. This product is acceptable for use where there is possibility of incidental food contact and as a product for use in the immersion or spray freezing of wrapped meat and packaged poultry products. Dow recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with Dow's stated use, please contact Dow's Customer Information Group.

Revision

Identification Number: 1376 / 0000 / Issue Date 11/05/2007 / Version: 2.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
WW	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)**

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATIONPRODUCT NAME : **NALCO® 8338**APPLICATION : **CLOSED SYSTEM CORROSION INHIBITOR**COMPANY IDENTIFICATION : **Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198****EMERGENCY TELEPHONE NUMBER(S) :** (800) 424-9300 (24 Hours) CHEMTREC**NFPA 704M/HMIS RATING****HEALTH :** 1 / 2 **FLAMMABILITY :** 0 / 0 **INSTABILITY :** 0 / 0 **OTHER :**
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Nitrite	7632-00-0	10.0 - 30.0
Sodium Tolyltriazole	64665-57-2	1.0 - 5.0
Sodium Hydroxide	1310-73-2	0.1 - 1.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******WARNING**

Contains sodium nitrite. May be harmful or fatal if swallowed. Substances in the product can lead to the formation of methemoglobin. Unborn children are particularly sensitive to methemoglobinemia. May cause skin and eye irritation. Do not get in eyes, on skin, on clothing. Do not take internally. Keep container tightly closed. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. If swallowed, seek medical advice immediately and show this container or label. Protect product from freezing.

Wear suitable protective clothing, gloves and eye/face protection.

May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. If product is allowed to dry, the sodium nitrite is an oxidizing agent and can initiate the combustion of other materials.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin



SAFETY DATA SHEET

PRODUCT

NALCO® 8338

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Can cause mild to moderate irritation.

SKIN CONTACT :

Can cause mild irritation.

INGESTION :

Not a likely route of exposure. Large exposures may be fatal. Ingestion of sodium nitrite can cause methemoglobinemia which can lead to cyanosis and possible death. Pregnant women and their fetuses are particularly sensitive to the effects of methemoglobinemia.

INHALATION :

Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

SYMPTOMS OF EXPOSURE :

Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :

Sodium Nitrite. Pregnant women are particularly sensitive to methemoglobinemia.

HUMAN HEALTH HAZARDS - CHRONIC :

Repeated ingestion of small amounts of sodium nitrite causes drops in blood pressure, rapid pulse, headaches and visual disturbances. It may also react with organic amines in the body to form carcinogenic nitrosamines.

4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get immediate medical attention.

SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. If symptoms persist, call a physician.

INGESTION :

Induce vomiting if the patient is fully conscious. If conscious, washout mouth and give water to drink. Get immediate medical attention.

INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition. Measures against circulatory shock, respiratory depression and convulsions may be needed.

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****5. FIRE FIGHTING MEASURES****FLASH POINT :** None**EXTINGUISHING MEDIA :**

Not expected to burn. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :

May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. If product is allowed to dry, the sodium nitrite is an oxidizing agent and can initiate the combustion of other materials.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES**PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).**ENVIRONMENTAL PRECAUTIONS :**

Do not contaminate surface water.

7. HANDLING AND STORAGE**HANDLING :**

Avoid eye and skin contact. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Keep the containers closed when not in use. Use with adequate ventilation.

STORAGE CONDITIONS :

Protect product from freezing. Store the containers tightly closed. Store in suitable labeled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**OCCUPATIONAL EXPOSURE LIMITS :**

This product does not contain any substance that has an established exposure limit.



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ENGINEERING MEASURES :

General ventilation is recommended.

RESPIRATORY PROTECTION :

Respiratory protection is not normally needed.

HAND PROTECTION :

Neoprene gloves Nitrile gloves Butyl gloves PVC gloves

SKIN PROTECTION :

Wear standard protective clothing.

EYE PROTECTION :

Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Keep an eye wash fountain available. Keep a safety shower available.

HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is: Moderate

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Clear Yellow
ODOR	Organic
SPECIFIC GRAVITY	1.16 - 1.20 @ 77 °F / 25 °C
DENSITY	9.7 - 10.0 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	11.5 - 14
VISCOSITY	3 cps @ 70 °F / 21 °C
FREEZING POINT	2 °F / -16.7 °C

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :

Contact with reducing agents (e.g. hydrazine, sulfites, sulfide, aluminum or magnesium dust) may generate heat, fires, explosions and toxic vapors. Do not mix with amines. Sodium nitrite can react with certain amines to produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

The following results are for the active components.

ACUTE ORAL TOXICITY :

Species: Rat
LD50: 180 mg/kg
Test Descriptor: Active Substance Sodium Nitrite

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

TERATOGENICITY AND EMBRYOTOXICITY :

Experimental animal studies with sodium nitrite have shown reproductive effects in the offspring of treated parents. These effects are not transmissible.

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	38 mg/l	Product
Fathead Minnow	96 hrs	303 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	250 mg/l	120 mg/l	Product

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Ceriodaphnia dubia	48 hrs	138 mg/l	Product
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PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 77,600 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	< 2 mg/l	Product

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****14. TRANSPORT INFORMATION**

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	None
DOT Reportable Quantity (per package) :	500 lbs
DOT RQ Component :	SODIUM NITRITE

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :**OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :**

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

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Sodium Nitrite : Target Organ Effect - Kidney, Target Organ Effect - Nervous system, Target Organ Effect - Blood
Sodium Tolytriazole : Corrosive
Sodium Hydroxide : Corrosive

CERCLA/SUPERFUND, 40 CFR 117, 302 :

This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product.

RQ Substance
Sodium Nitrite

RQ
500 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
X	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

<u>Hazardous Substance(s)</u>	<u>CAS NO</u>	<u>% (w/w)</u>
Sodium Nitrite	7632-00-0	10.0 - 30.0

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 141519

This product is acceptable for treating boilers, steam lines, and/or cooling systems where neither the treated water nor the steam produced may contact edible products in and around food processing areas, excluding such use in areas where meat and poultry are processed (G10).

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Sodium Nitrite	Sec. 311

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Sodium Nitrate	7631-99-4
Sodium Nitrite	7632-00-0
Sodium Tolytriazole	64665-57-2
Sodium Hydroxide	1310-73-2
Water	7732-18-5

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

D1B - Materials Causing Immediate and Serious Toxic Effects - Toxic Material, D2A - Materials Causing Other Toxic Effects - Very Toxic Material, E - Corrosive Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****AUSTRALIA**

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA

This product contains substance(s) which are not in compliance with the Toxic Chemical Control Law (TCCL) and may require additional review.

NEW ZEALAND

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Moderate

* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

**SAFETY DATA SHEET****PRODUCT****NALCO® 8338****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department

Date issued : 07/31/2009

Version Number : 1.9

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)**

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : 3D TRASAR® 3DT283

APPLICATION : COOLING WATER TREATMENT

COMPANY IDENTIFICATION :
Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 2 / 2 FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Phosphoric Acid	7664-38-2	5.0 - 10.0
Substituted aromatic amine	Proprietary	1.0 - 5.0
Sulfuric Acid	7664-93-9	1.0 - 5.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******WARNING**

Irritating to eyes and skin.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.

Wear suitable protective clothing.

Not flammable or combustible.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Irritating, and may injure eye tissue if not removed promptly.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000

For additional copies of an MSDS visit www.nalco.com and request access



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SKIN CONTACT :

Can cause moderate irritation.

INGESTION :

Not a likely route of exposure. There may be irritation to the gastro-intestinal tract.

INHALATION :

Not a likely route of exposure. Elevated temperatures or mechanical action may form vapors, mists or fumes which may be irritating to the eyes, nose, throat and lungs.

SYMPTOMS OF EXPOSURE :

Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If symptoms develop, seek medical advice.

SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. If symptoms develop, seek medical advice.

INGESTION :

Get medical attention. Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink.

INHALATION :

Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT :

Not applicable

EXTINGUISHING MEDIA :

This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.



SAFETY DATA SHEET

PRODUCT

3D TRASAR® 3DT283

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

FIRE AND EXPLOSION HAZARD :

Not flammable or combustible.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled.

STORAGE CONDITIONS :

Store in suitable labeled containers. Store the containers tightly closed. Store separately from bases.

SUITABLE CONSTRUCTION MATERIAL :

Buna-N, Polypropylene, Polyethylene, EPDM, Brass, HDPE (high density polyethylene), Epoxy phenolic resin, Chlorosulfonated polyethylene rubber

UNSUITABLE CONSTRUCTION MATERIAL :

Polyurethane, Neoprene, Stainless Steel 304, Stainless Steel 316L, 100% phenolic resin liner, Fluoroelastomer

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Phosphoric Acid	ACGIH/TWA		1	
	ACGIH/STEL		3	
	OSHA Z1/PEL		1	
Sulfuric Acid (Thoracic fraction.) Sulfuric Acid	ACGIH/TWA		0.2	
	OSHA Z1/PEL		1	

ENGINEERING MEASURES :

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

RESPIRATORY PROTECTION :

Where concentrations in air may exceed the limits given in this section, the use of a half face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge, with a Particulate pre-filter. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used.

HAND PROTECTION :

When handling this product, the use of chemical gauntlets is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :

When handling this product, the use of overalls, a chemical resistant apron and rubber boots is recommended. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :

When handling this product, the use of splash chemical goggles is recommended.

HYGIENE RECOMMENDATIONS :

Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Yellow
ODOR	None
SPECIFIC GRAVITY	1.13 @ 77.0 °F / 25.0 °C
DENSITY	9.4 lb/gal

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

SOLUBILITY IN WATER	Complete
pH (100.0 %)	1.5
VISCOSITY	3.8 cps @ 77.0 °F / 25.0 °C
INITIAL BOILING POINT	212.0 °F / 100.0 °C
VOC CONTENT	0.4 % Calculated

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY**STABILITY :**

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Avoid extremes of temperature.

MATERIALS TO AVOID :

Bases Contact with strong alkalis (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: None known

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: *Moderate*

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****ACUTE FISH RESULTS :**

Species	Exposure	LC50	Test Descriptor
Fathead Minnow	96 hrs	3,750 mg/l	Product
Rainbow Trout	96 hrs	3,558 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		3,611 mg/l	Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 50,000 mg/l

Chemical Oxygen Demand (COD) : 150,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	4,250 mg/l	Product

The organic portion of this preparation is expected to be inherently biodegradable.

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Hazardous Waste: D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

Empty drums should be taken for recycling, recovery, or disposal through a suitably qualified or licensed contractor.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	Not applicable

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III



SAFETY DATA SHEET

PRODUCT

3D TRASAR® 3DT283

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Phosphoric Acid : Corrosive
Substituted aromatic amine : Eye irritant
Sulfuric Acid : Corrosive

CERCLA/SUPERFUND, 40 CFR 302 :

This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance

Sulfuric Acid

RQ

53,684 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product. If a reportable quantity of product is released, it requires notification to your State Emergency Response Commission. You may also be required to notify the National Response Center - See CERCLA/SUPERFUND, above.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
	Delayed (Chronic) Health Hazard
	Fire Hazard
	Sudden Release of Pressure Hazard
	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT283****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :**

This product contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

Hazardous Substance(s)
Sulfuric Acid

CAS NO
7664-93-9

% (w/w)
1.0 - 5.0

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 138493

This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels. This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
<ul style="list-style-type: none">Phosphoric AcidSulfuric Acid	Sec. 311

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels. This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:



SAFETY DATA SHEET

PRODUCT

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EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Substituted aromatic amine
Phosphoric Acid
Sulfuric Acid

Proprietary
7664-38-2
7664-93-9

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

16. OTHER INFORMATION

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.



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3D TRASAR® 3DT283

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/15/2010
Version Number : 1.5

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : 3D TRASAR® 3DT289

APPLICATION : COOLING WATER TREATMENT

COMPANY IDENTIFICATION :
Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 2 / 2 FLAMMABILITY : 0 / 1 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Phosphoric Acid	7664-38-2	1.0 - 5.0
Substituted aromatic amine	Proprietary	1.0 - 5.0
Sulfuric Acid	7664-93-9	1.0 - 5.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******WARNING**

Irritating to eyes.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Use a mild soap if available.

Wear suitable protective clothing. Wear chemical splash goggles.

Not flammable or combustible. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Can cause moderate to severe irritation.

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SKIN CONTACT :

May cause irritation with prolonged contact.

INGESTION :

Not a likely route of exposure. There may be irritation to the gastro-intestinal tract with nausea and vomiting.

INHALATION :

Not a likely route of exposure. Repeated or prolonged exposure may irritate the respiratory tract.

HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. Get medical attention.

SKIN CONTACT :

Flush with large amounts of water. Use soap if available. If symptoms develop, seek medical advice.

INGESTION :

Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :

Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT :

Not applicable

EXTINGUISHING MEDIA :

This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :

Not flammable or combustible. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Keep people away from and upwind of spill/leak. Ventilate spill area if possible. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

Prevent material from entering sewers or waterways.

7. HANDLING AND STORAGE**HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled.

STORAGE CONDITIONS :

Store in suitable labeled containers. Store the containers tightly closed.

SUITABLE CONSTRUCTION MATERIAL :

Buna-N, EPDM, Polyethylene, Polypropylene, HDPE (high density polyethylene), PVC, Epoxy phenolic resin, Chlorosulfonated polyethylene rubber. Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

UNSUITABLE CONSTRUCTION MATERIAL :

Brass, Stainless Steel 304, Neoprene, Polyurethane, 100% phenolic resin liner, Stainless Steel 316L, Fluoroelastomer

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**OCCUPATIONAL EXPOSURE LIMITS :**

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Phosphoric Acid	ACGIH/TWA		1	
	ACGIH/STEL		3	
	OSHA Z1/PEL		1	

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**Sulfuric Acid (Thoracic fraction.)
Sulfuric AcidACGIH/TWA
OSHA Z1/PEL0.2
1**ENGINEERING MEASURES :**

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :

Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :

When handling this product, the use of chemical gloves is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :

Wear standard protective clothing.

EYE PROTECTION :

Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :

Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE Liquid

APPEARANCE Yellow

ODOR None

SPECIFIC GRAVITY 1.151 @ 77 °F / 25 °C

DENSITY 9.56 lb/gal

SOLUBILITY IN WATER Complete

pH (100 %) 1.8

VISCOSITY 5.4 cst

INITIAL BOILING POINT 212 °F / 100 °C

VAPOR PRESSURE 0.5 mm Hg @ 100 °F / 37.8 °C

VOC CONTENT 0.4 % Calculated

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY**STABILITY :**

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Freezing temperatures.

MATERIALS TO AVOID :

Bases Contact with strong alkalies (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of sulfur, Oxides of phosphorus

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Fathead Minnow	96 hrs	3,750 mg/l	Product
Rainbow Trout	96 hrs	1,830 mg/l	Product

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For additional copies of an MSDS visit www.nalco.com and request access

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****ACUTE INVERTEBRATE RESULTS :**

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		1,908 mg/l	Product
Ceriodaphnia dubia	48 hrs	1,875 mg/l		Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 62,000 mg/l

Chemical Oxygen Demand (COD) : 190,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	9,240 mg/l	Product

The organic portion of this preparation is expected to be readily biodegradable.

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	10 - 30%	70 - 90%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	Not applicable
Reportable Quantity (per package) :	53,330 lbs
RQ Component :	Sulfuric Acid

AIR TRANSPORT (ICAO/IATA) :

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)
Reportable Quantity (per package) :	53,330 lbs
RQ Component :	Sulfuric Acid

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	PHOSPHORIC ACID, SULFURIC ACID
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****15. REGULATORY INFORMATION**

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :**OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :**

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Phosphoric Acid : Corrosive

Substituted aromatic amine : Eye Irritant

Sulfuric Acid : Corrosive

CERCLA/SUPERFUND, 40 CFR 302 :

This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance

Sulfuric Acid

RQ

53,330 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product. If a reportable quantity of product is released, it requires notification to your State Emergency Response Commission. You may also be required to notify the National Response Center - See CERCLA/SUPERFUND, above.

Extremely Hazardous Substance

Sulfuric Acid

TPQ

1,000 lbs

RQ

53,300 lbs

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

- X Immediate (Acute) Health Hazard
- Delayed (Chronic) Health Hazard
- Fire Hazard
- Sudden Release of Pressure Hazard
- Reactive Hazard

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

<u>Hazardous Substance(s)</u>	<u>CAS NO</u>	<u>% (w/w)</u>
Sulfuric Acid	7664-93-9	1.0 - 5.0

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 136003

This product is acceptable for treatment of cooling and retort water in and around food processing areas, excluding such use in areas where meat and poultry are processed (G8).

This product is acceptable for treating boilers, steam lines, and/or cooling systems where neither the treated water nor the steam produced may contact edible products in and around food processing areas, excluding such use in areas where meat and poultry are processed (G10).

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

<u>Substance(s)</u>	<u>Citations</u>
<ul style="list-style-type: none">Phosphoric AcidSulfuric Acid	Sec. 311

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

<u>Substance(s)</u>	<u>Citations</u>
<ul style="list-style-type: none">Methanol	Sec. 112

CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

**SAFETY DATA SHEET****PRODUCT****3D TRASAR® 3DT289****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****MICHIGAN CRITICAL MATERIALS :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

The balance of the substances in this product are not classified as hazardous or are present below hazard cut-off limits	Proprietary
Phosphoric Acid	7664-38-2
Sulfuric Acid	7664-93-9
Substituted aromatic amine	Proprietary

INTERNATIONAL CHEMICAL CONTROL LAWS :**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :**

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION



SAFETY DATA SHEET

PRODUCT

3D TRASAR® 3DT289

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/14/2010
Version Number : 1.12

**SAFETY DATA SHEET**

PRODUCT

STABREX® ST70

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : STABREX® ST70

COMPANY IDENTIFICATION :
Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 3 / 3 FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Hydroxide	1310-73-2	1.0 - 5.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******DANGER**

CORROSIVE. CAUSES SEVERE EYE AND SKIN INJURY. HARMFUL IF INHALED. HARMFUL IF SWALLOWED. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash thoroughly after handling. May evolve hydrogen bromide and bromine under fire conditions. May evolve HCl under fire conditions. May evolve chlorine under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Corrosive. Will cause eye burns and permanent tissue damage.SKIN CONTACT :
May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered.

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SAFETY DATA SHEET

PRODUCT

STABREX® ST70

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INGESTION :

Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach.

INHALATION :

Not a likely route of exposure. Irritating, in high concentrations, to the eyes, nose, throat and lungs.

SYMPTOMS OF EXPOSURE :

Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :

Get immediate medical attention. PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Immediately flush eye with water for at least 15 minutes while holding eyelids open.

SKIN CONTACT :

Get immediate medical attention. Immediately flush with plenty of water for at least 15 minutes. For a large splash, flood body under a shower. Remove contaminated clothing. Wash off affected area immediately with plenty of water. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

INGESTION :

Get immediate medical attention. DO NOT INDUCE VOMITING. Do not give anything to drink.

INHALATION :

Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

IF IN EYES: Immediately flush with plenty of water for at least 15 minutes. Call a physician.

IF ON SKIN: Immediately wash with soap and plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if irritation persists.

IF SWALLOWED: DO NOT INDUCE VOMITING. Do not give anything to drink. Seek medical advice with urgency.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.



SAFETY DATA SHEET

PRODUCT

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5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :

Not expected to burn. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :

May evolve hydrogen bromide and bromine under fire conditions. May evolve HCl under fire conditions. May evolve chlorine under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Contain and absorb with sand or vermiculite and mix well. Collect up and remove to a safe place until disposal. Wash site of spillage thoroughly with water. Assistance can be obtained from waste disposal companies.

LARGE SPILLS: Dike to prevent further movement. Recover by pumping or by using a suitable absorbent. Reclaim into recovery or salvage drums. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Apply this pesticide only as specified on the label.

7. HANDLING AND STORAGE

HANDLING :

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.



SAFETY DATA SHEET

PRODUCT

STABREX® ST70

EMERGENCY TELEPHONE NUMBER(S)

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STORAGE CONDITIONS :

Store the containers tightly closed. Store separately from acids. Store in a cool well ventilated area away from direct sunlight.

SUITABLE CONSTRUCTION MATERIAL :

Polyethylene, Polypropylene, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use., HDPE (high density polyethylene), Neoprene, PVC, Polyurethane, Hypalon, Viton

UNSUITABLE CONSTRUCTION MATERIAL :

Brass, Buna-N, EPDM, Stainless Steel 316L, Stainless Steel 304, Mild steel, 100% phenolic resin liner, Epoxy phenolic resin

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Country/Source	Substance(s)	Category:	ppm	mg/m3
	Sodium Hydroxide	ACGIH/Ceiling		2
		OSHA Z1/PEL		2

ENGINEERING MEASURES :

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :

If significant mists, vapors or aerosols are generated an approved respirator is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge. with a Particulate pre-filter. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :

PVC gloves Rubber gloves Neoprene gloves Nitrile gloves Butyl gloves Viton# gloves

SKIN PROTECTION :

Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :

Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :

Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****9. PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow Clear
ODOR	None
SPECIFIC GRAVITY	1.32 - 1.36 @ 77 °F / 25 °C
DENSITY	11.0 - 11.3 lb/gal
SOLUBILITY IN WATER	Complete
pH (100.0 %)	13.0
FREEZING POINT	17 °F / -8.3 °C
VAPOR PRESSURE	7.7 mm Hg @ 77 °F / 25 °C 27 mm Hg @ 115 °F / 46 °C
VOC CONTENT	0.00 %

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY**STABILITY :**

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

High temperatures Direct sunlight

MATERIALS TO AVOID :

Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with organic materials (e.g. rags, sawdust, hydrocarbon oils or solvents) and avoid reducing agents (e.g. hydrazine, sulfites, sulfide, aluminum or magnesium dust) which can generate heat, fires, explosions and the release of toxic fumes. Do not mix with any sodium hypochlorite or bleach product. Resulting mixture will result in a violent exothermic reaction releasing large amounts of nitrogen gas and liquid sulfuric acid. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Chlorine gas, HCl, Bromine, Hydrogen bromide, Oxides of nitrogen, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

ACUTE ORAL TOXICITY :

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**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Species: Rat
LD50: > 5,000 mg/kg
Test Descriptor: Similar Product

PRIMARY SKIN IRRITATION :

Species: Rabbit
Draize Score: 7.9 /8.0
Test Descriptor: Similar Product

PRIMARY EYE IRRITATION :

Species: Rabbit
Draize Score: /110.0
Test Descriptor: Similar Product

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	4.5 mg/l	Product
Fathead Minnow	96 hrs	8.3 mg/l	Product
Sheepshead Minnow	96 hrs	16 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	4.3 mg/l	4.2 mg/l	Product
Ceriodaphnia dubia	48 hrs	1.6 mg/l		Product
Mysid Shrimp (Mysidopsis bahia)	96 hrs	27 mg/l		Product

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****AQUATIC PLANT RESULTS :**

Species	Exposure	EC50/LC50	Test Descriptor
Green Algae (Pseudokirchneriella subcapitata, previously Selenastrum capricornutum)	72 hrs	3.66 mg/l	Product

CHRONIC FISH RESULTS :

Species	Exposure	NOEC / LOEC	End Point	Test Descriptor
Fathead Minnow	7 Days	2.5 mg/l / 5 mg/l	Growth	Product

CHRONIC INVERTEBRATE RESULTS :

Species	Test Type	NOEC / LOEC	End Point	Test Descriptor
Ceriodaphnia dubia	3 Brood	10.0 mg/l /	Reproduction	Product

PERSISTENCY AND DEGRADATION :

Biological Oxygen Demand (BOD) : This material is an oxidizing biocide and is not expected to persist in the environment.

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	30 - 50%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Moderate

If released into the environment, see CERCLA/SUPERFUND in Section 15.

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****13. DISPOSAL CONSIDERATIONS**

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

METAL CONTAINERS: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. **PLASTIC CONTAINERS:** Do not reuse empty container. Triple rinse (or equivalent). Then puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE
	ANTIMICROBIAL
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	II
Flash Point :	None
DOT Reportable Quantity (per package) :	35,000 lbs
DOT RQ Component :	SODIUM HYDROXIDE

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE
	ANTIMICROBIAL
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	II
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	30 L (Max net quantity per package)

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****MARINE TRANSPORT (IMDG/IMO) :**

Proper Shipping Name :

Technical Name(s) :

UN/ID No :

Hazard Class - Primary :

Packing Group :

CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.

SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE

ANTIMICROBIAL

UN 3266

8

II

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :**OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :**

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Hydroxide : Corrosive

CERCLA/SUPERFUND, 40 CFR 117, 302 :

This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance

Sodium Hydroxide

RQ

35,000 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :**SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :**

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

- | | |
|---|-----------------------------------|
| X | Immediate (Acute) Health Hazard |
| - | Delayed (Chronic) Health Hazard |
| - | Fire Hazard |
| - | Sudden Release of Pressure Hazard |
| - | Reactive Hazard |

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : the following use conditions.

This product may be employed in the treatment of papermill influent water systems in plants where paper or paperboard destined for food contact purposes is manufactured as long as the bromide ion concentration in the water is no greater than 22 ppm.

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 140603

This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas. This product is acceptable for treating boilers, steam lines, and/or cooling systems (G7) where neither the treated water nor the steam produced may contact edible products in and around food processing areas.

FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA) :

EPA Reg. No. 1706-179

In all cases follow instructions on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Sodium Hydroxide	Sec. 311

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.



SAFETY DATA SHEET

PRODUCT

STABREX® ST70

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

Sodium Hydroxide

1310-73-2

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

Pesticide controlled products are not regulated under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

Substances regulated under the Pest Control Products Act are exempt from CEPA New Substance Notification requirements.

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substance(s) in this preparation are included in or exempted from the EINECS or ELINCS inventories

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

**SAFETY DATA SHEET****PRODUCT****STABREX® ST70****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****PHILIPPINES**

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Nalco: EHS2818, F105047/104688

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight® CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight® CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000

For additional copies of an MSDS visit www.nalco.com and request access



SAFETY DATA SHEET

PRODUCT

STABREX® ST70

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Ariel Insight® (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight® CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department

Date issued : 07/31/2009

Version Number : 1.15

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO 7330****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME : NALCO 7330

APPLICATION : BIOCIDES

Date issued : 16-Nov-06

COMPANY IDENTIFICATION

CHINA:	NALCO INDUSTRIAL SERVICES (SUZHOU) CO, LTD	TEL: 86-512-68255001	FAX: 86-512-68250130
INDIA:	NALCO INDIA LIMITED	TEL: 91-33-22172066	FAX: 91-33-22296858
INDONESIA:	PT NALCO INDONESIA	TEL: 62-21-8753175	FAX: 62-21-8753167
KOREA:	NALCO KOREA LIMITED	TEL: 82-2-789-6961	FAX: 82-2-786-3140
MALAYSIA:	NALCO INDUSTRIAL SERVICES MALAYSIA SDN BHD	TEL: 603-5569 4118	FAX: 603-5569 5955
PHILIPPINES:	NALCO PHILIPPINES INC	TEL: 63-49-5451550	FAX: 63-49-5453442
SINGAPORE:	NALCO PACIFIC PTE LTD	TEL: 65-6861-4011	FAX: 65-6862 0850
THAILAND:	NALCO INDUSTRIAL SERVICES (THAILAND) CO, LTD	TEL: 66-38-955-160	FAX: 66-38-955-166

See Section 16 for address information.

EMERGENCY TELEPHONE NUMBER(S) : See section 16, for Emergency Telephone Numbers.**2. COMPOSITION/INFORMATION ON INGREDIENTS**

CHEMICAL DESCRIPTION : Water, substituted isothiazoline.

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

CHEMICAL NAME	CAS NO	% (w/w)
5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	1.1
2-methyl-4-isothiazolin-3-one	2682-20-4	0.1 - 1

3. HAZARDS IDENTIFICATION**HUMAN HEALTH HAZARDS - ACUTE****EYE CONTACT**

Corrosive. Will cause eye burns and permanent tissue damage.

SKIN CONTACT

May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered. Skin irritation effects can be delayed for hours. Repeated or prolonged contact may cause skin sensitization.

INGESTION

Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach.

INHALATION

Not a likely route of exposure. Irritating, in high concentrations, to the eyes, nose, throat and lungs.

HUMAN HEALTH HAZARDS - CHRONIC

No adverse effects expected other than those mentioned above.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 7330

4. FIRST AID MEASURES

EYE CONTACT

Get immediate medical attention. PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Immediately flush eye with water for at least 15 minutes while holding eyelids open. If only one eye is affected be sure to use care not to contaminate the other eye with the run-off.

SKIN CONTACT

Get immediate medical attention. Remove contaminated clothing and wash before reuse. Immediately flush with plenty of water for at least 15 minutes. For a large splash, flood body under a shower. Contaminated leather articles such as shoes or belts must be discarded.

INGESTION

DO NOT INDUCE VOMITING. Get immediate medical attention. If conscious, washout mouth and give water to drink.

INHALATION

Remove to fresh air, treat symptomatically. Artificial respiration and/or oxygen may be necessary. Get medical attention.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed. Skin burns and corrosion may be delayed for several hours. 1% hydrocortison cream may be used to alleviate symptoms.

5. FIRE FIGHTING MEASURES

FLASH POINT : Not flammable

EXTINGUISHING MEDIA

Not expected to burn. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD

Not flammable or combustible. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions. May evolve HCl under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP

Cover drains to stop contamination of waterways. Dike and absorb with inert material (e.g. dry earth, sand), shovel all contaminated solids into a pail or drum then seal for disposal. DO NOT add deactivation solution to the waste container to deactivate the absorbed material. Treat spill residue, contaminated surfaces and equipments with 10 times as much deactivation solution as estimated residual spill and wait 30 minutes, or until the reaction has subsided. Rinse thoroughly with clean water. DO NOT use deactivation solution on skin, eyes or clothing. DEACTIVATION SOLUTION - prepare a fresh solution of 5% sodium bicarbonate and 5% sodium



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hypochlorite in water (i.e. add 50 grams of sodium bicarbonate per 1 liter of household bleach, seal container then shake well for 1 minute) away from the immediate area of spill. Prepare 10 times the estimated volume of the residual spill. The materials and equipment for preparing solutions should be kept available for use in areas where spills may occur. Contact approved waste hauler for disposal of contaminated recovered material. Dispose of materials in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS

This product is toxic to fish and other water organisms. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies. Do not contaminate water by cleaning of equipment or disposal of wastes.

7. HANDLING AND STORAGE

HANDLING

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Ensure all containers are labelled. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Avoid generating aerosols and mists. Skin irritation effects can be delayed for hours. Treat all wetting of the skin and/or clothes which occurs during handling as contact with the product and administer first aid immediately.

STORAGE CONDITIONS

Store in suitable labelled containers. Store the containers tightly closed. Store separately from oxidizers. Protect product from freezing.

SUITABLE CONSTRUCTION MATERIAL

Teflon, Polyethylene, Stainless Steel 316L, EPDM, Stainless steel 304, Hastelloy C-276, HDPE, PVC, Plexiglass, Kalrez, Alfax.

UNSUITABLE CONSTRUCTION MATERIAL

Brass, Neoprene, Mild steel, Aluminum, Copper, Brass, Buna-N, Polypropylene, Ethylene propylene, Polyurethane, Viton, Hypalon.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Manufacturer's

Recommendation :

Substance(s)

5-Chloro-2-Methyl-4-Isothiazolin-3-one

TWA: 0.1000 mg/m³

STEL: 0.30000 mg/m³

ENGINEERING MEASURES

Use a closed dosing system. Use local exhaust ventilation if necessary to control airborne mist and vapor.

PERSONAL PROTECTION

GENERAL ADVICE

The use and choice of personal protection equipment is related to the hazard of the product, the workplace and the way the product is handled. In general, we recommend as a minimum precaution that safety glasses with side-shields and workclothes protecting arms, legs and body be used. In addition any person visiting an area where this product is handled should at least wear safety glasses with side-shields.

RESPIRATORY PROTECTION



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An approved respirator must be worn if the occupational exposure limit is likely to be exceeded. An organic vapor cartridge with dust/mist prefilter or supplied air may be used. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION

Nitrile gloves, Butyl gloves, Viton(tm) gloves.

SKIN PROTECTION

Wear impervious apron and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION

Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS

Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow Green
ODOR	Mild
Flash Point	Not flammable
SPECIFIC GRAVITY	1.03 @ 15 °C
SOLUBILITY IN WATER	Complete
pH (100%)	3 - 5
MELTING POINT	-4 °C
VOC CONTENT	0.8 %

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY

Stable under normal conditions.

HAZARDOUS POLYMERIZATION

Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Freezing temperatures.

MATERIALS TO AVOID

Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS

Under fire conditions:

- Oxides of carbon
- Oxides of sulfur
- Oxides of nitrogen
- HCl

**MATERIAL SAFETY DATA SHEET**

PRODUCT

NALCO 7330**11. TOXICOLOGICAL INFORMATION****ACUTE TOXICITY DATA**

The following results are for the product along with results on the hazardous components.

ACUTE ORAL TOXICITY :

Species	LD50	Test Descriptor
Rat	3810 mg/kg	Product

ACUTE DERMAL TOXICITY :

Species	LD50	Test Descriptor
Rabbit	>5000 mg/kg	Product

ACUTE INHALATION TOXICITY :

Species	LC50	Test Descriptor
Rat	13.7 mg/kg	Product

PRIMARY SKIN IRRITATION :

Draize Score	Test Descriptor
>5.1, <6.5 / 8.0	Product

PRIMARY EYE IRRITATION :

Draize Score	Test Descriptor
>80/110.0	Product

PRIMARY SKIN IRRITATION : A 1.5% active solution is corrosive to skin, a 0.6% active solution is a severe skin irritant, a 0.3% active solution is a moderate skin irritant and a 0.06% active solution is a non-irritant.

PRIMARY EYE IRRITATION : A 1.5% active solution is corrosive to the eyes, a 0.3% active solution is an eye irritant and 0.06% active solution is a non-irritant.

SENSITIZATION

A Guinea pig (Buehler Technique) sensitization study with an induction dosage of 90 ppm of active ingredients followed by an insult of 429 ppm of active ingredients was positive. A human repeated insult patch study of 28 ppm active ingredients followed by an insult of 56 ppm of active ingredients resulted in no effect to the subjects tested.

CHRONIC TOXICITY DATA

A 90-day dietary study in dogs of 840 ppm of isothiazolinone resulted in no mortalities or pathological findings. A 90-day dermal study in rabbits of 0.4 mg/kg/day of isothiazolinone resulted in irritation but no pathological effects. A 30-month skin painting study with mice using 400 ppm isothiazolinone three times per week showed no increased tumor frequency over control. A teratology study with rabbits and rats was negative using dosages of 1.5 to 15 mg/kg isothiazolinone. Mutagenicity results have been equivocal.

CARCINOGENICITY

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION:

Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS**

**MATERIAL SAFETY DATA SHEET**

PRODUCT

NALCO 7330

The following results are for the product along with results on the active substances.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Sheepshead Minnow	96.00 hrs	32 mg/l	Product
Bluegill Sunfish	96 hrs	18.67 mg/l	Product
Fathead Minnow	144 hrs	8 mg/l	Product
Rainbow Trout	96 hrs	12.67 mg/l	Product

Rating : Slightly toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	Tested Substance
Mysid Shrimp (A. bahia)	96.00 hrs	18 mg/l	Product
Ceriodaphnia dubia	48 hrs	15 mg/l	Product
Daphnia magna	48 hrs	8.7 - 12 mg/l	Product

Rating : Slightly toxic

AVIAN RESULTS :

Species	Exposure	LC50	Tested Substance
Bobwhite Quail		97 mg/kg	Product
Pekin Duck	8.00 Days	560 mg/kg	Active Substance

PERSISTENCY AND DEGRADATION

Total Organic Carbon (TOC): 7,580 mg/L

Chemical Oxygen Demand (COD): 20,000 mg/L

The degradation of the major active substance begins with ring opening and elimination of chloride ion. Degradation leads to the formation of a variety of small organic acids, methylamine, carbon dioxide and elemental sulfur. The half life of each active substance is dependent upon the initial concentration.

MOBILITY AND BIOACCUMULATION POTENTIAL

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite (TM) , provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models. If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages; < 5%; 30 - 50%; 50 - 70%; The portion in water is expected to be soluble or dispersible. Discharge in minor quantity into adapted biological units of sewage treatment plants is not expected to affect the efficiency of the activated sludge process.

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD CHARACTERIZATION:

Based on our hazard characterization, the potential environmental hazard is: Moderate

13. DISPOSAL CONSIDERATIONS

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO 7330**

Empty drums should be taken for recycling, recovery, or disposal through a suitably qualified or licensed contractor.

NATIONAL REGULATIONS, CHINA

Comply with local regulations.

NATIONAL REGULATIONS, INDIA

Dispose of unused product in accordance with the "Hazardous Wastes (Management and Handling) Rules 1989" and local and State legislation, as applicable.

NATIONAL REGULATIONS, INDONESIA

Dispose of unused product in accordance with "Government Regulation No.19/1994 On the Treatment of Dangerous And Toxic Waste" (and amendments) as applicable.

NATIONAL REGULATIONS, KOREA

Waste disposal should comply with the Waste Control Act.

NATIONAL REGULATIONS, MALAYSIA

Dispose of in accordance with the Environmental Quality (Scheduled Wastes) Regulation 1989 and other guidelines issued by DOE and/or local authorities.

NATIONAL REGULATIONS, PHILIPPINES

Dispose of in accordance with Presidential Decree No. 984-1976 ("The Pollution Control Law"); DENR Department Administrative Order No.29-92 ("The Implementing Rules or Regulations of RA6969") and Presidential Decree No.825.

NATIONAL REGULATIONS, SINGAPORE

Dispose of waste in accordance with the Environmental Health Act (Chapter 95, Rg 11), Environmental Public Health (Toxic Industrial Waste) Regulations 1990 Ed.

NATIONAL REGULATIONS, THAILAND

Dispose of hazardous waste in accordance with the "The Notification of the Ministry of Industry No. 6B.E. 2450, subject : Disposal of Wastes or Unusable Materials ", "The Notification of the Ministry of Industry No. 1B.E. 2451, subject : Disposal of Wastes or Unusable Materials ".

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT

Proper Shipping Name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name(s)	ISOTHIAZOLINONE MICROBICIDE
UN/ID No	UN 3265
Hazard Class - Primary	8
Packing Group	II
HAZCHEM CODE:	2X

NATIONAL REGULATIONS, CHINA

Comply with local regulations.

NATIONAL REGULATIONS, INDIA

Transport in accordance with the Central Motor Vehicles Rules 1989.

**MATERIAL SAFETY DATA SHEET**

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NALCO 7330**NATIONAL REGULATIONS, INDONESIA**

Transport in accordance with all government regulations, including "Regulation of the Minister of Health No.453/Man.Kes/PER/XI/1983

NATIONAL REGULATIONS, KOREA

Land transport should comply with the Ministerial Decree of Toxic Chemicals Control Law and the Regulations Regarding the Fire Fighting Techniques Standards, as applicable.

NATIONAL REGULATIONS, MALAYSIA

There are no regulations specifically governing the transport of chemicals. Use best practice.

NATIONAL REGULATIONS, PHILIPPINES

Transport in accordance with the following legislation (as applicable): Presidential Decree No. 1185, 1977 ("Fire Code of the Philippines") and implementing rules and regulations; Presidential Decree No. 856, 1975 ("Code of Sanitation"); Republic Act No 6969, 1990 ("Toxic Substances and Hazardous and Nuclear Wastes Control Act") and implementing rules and regulations.

NATIONAL REGULATIONS, SINGAPORE

Land Transport complies with the Environmental Pollution Control (Hazardous Substances) Regulations 1999, which follows the "Specification for Caution Labelling for Hazardous Substances" - Singapore Standard 286 (1984).

NATIONAL REGULATIONS, THAILAND

The product should be transported in accordance with "Hazardous Substances Acts B.E.2535", "Notification of Ministry of Public Health Re:Label and level of Toxicity of Dangerous Articles Which are Under the Responsibility of Food and Drug Administration 2534 (If applicable)" and "Notification of land transportation department, subject: label of truck which contain hazardous material, Notification date: 14 November B.E.2543 (14 November 2000)".

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name(s)	ISOTHIAZOLINONE MICROBIOCID
UN/ID No	UN 3265
Hazard Class - Primary	8
Packing Group	II
IATA Cargo Packing Instructions	820
IATA Cargo Aircraft Limit	60 L
IATA Passenger Packing Instructions	Y818 / 818
IATA Passenger Aircraft Limit	1 L / 5 L

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name(s)	ISOTHIAZOLINONE MICROBIOCID
UN/ID No	UN 3265
Hazard Class - Primary	8
Packing Group	II
EmS-Nr.	8-15

15. REGULATORY INFORMATION**NATIONAL REGULATIONS, EUROPE AND MALAYSIA**

European:

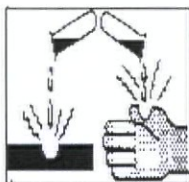


MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 7330

HAZARD SYMBOLS:



CLASSIFICATION: Corrosive. / C

Contains: 2-methyl-4-isothiazolin-3-one, 5-chloro-2-methyl-4-isothiazolin-3-one

RISK PHRASES:

R34 Causes burns.
R43 May cause sensitization by skin contact.

Malaysian:

HAZARD SYMBOLS:



CLASSIFICATION: Corrosive. / C

Contains: 2-methyl-4-isothiazolin-3-one, 5-chloro-2-methyl-4-isothiazolin-3-one

RISK PHRASES:

R34 Causes burns.
R43 May cause sensitization by skin contact.

SAFETY PHRASES:

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of water.
S37/39 Wear suitable gloves and eye/face protection.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

INTERNATIONAL REGULATIONS :

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under: 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods. and 21 CFR 176.300 – Slimicides

<u>Maximum Dosage</u>	<u>Limitation</u>
FOR 176.300: 0.125 (ACTIVES)	of dry weight fiber



MATERIAL SAFETY DATA SHEET

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NALCO 7330

FOR 176.170/180: 1675 PPM

as an anti microbial agent for finishing coating formulations and for additives used in the manufacture of paper and paperboard, including fillers, binders, pigment slurries and sizing solutions

FOR 176.170/180: 3350 PPM

as an antimicrobial agent for polymer latex emulsions in paper coatings

NFPA 704M / HMIS RATING

HEALTH : 3 FLAMMABILITY : 1 REACTIVITY : 0 OTHER : -

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

INTERNATIONAL CHEMICAL CONTROL LAWS :

TOXIC SUBSTANCES CONTROL ACT (TSCA)

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

EUROPE

The substances in this preparation are included in or exempted from the EINECS or ELINCS inventories.

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS) and are listed on the Australian Inventory of Chemical Substances (AICS).

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Ministry of International Trade & Industry List (MITI).

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

THE PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippine Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

ADDRESSES AND CONTACT POINTS:

NALCO INDUSTRIAL SERVICES (SUZHOU) CO, LTD; 88 Ta Yuan Road, Suzhou New Development Zone, Jiangsu 215011 PRC

NALCO INDIA LIMITED; 20/A Park St, Calcutta 700016 India

PT NALCO INDONESIA; Jl. Pahlawan, Desa Karang Asem Timur, Citeureup, Bogor, Indonesia

NALCO KOREA LIMITED; 11th Fl, 63BLDG, 60, Yoido-dong Young Deung Po-Gu, Seoul, Korea



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 7330

NALCO INDUSTRIAL SERVICES MALAYSIA SDN BHD; No 1, Jalan Jururancang U1/21, Seksyen U1, Hicom-Glenmarie Industrial Park, 40150 Shah Alam, Selangor Darul Ehsan, Malaysia

NALCO PHILIPPINES INC; Barrio Real, Calamba, Laguna, Philippines

NALCO PACIFIC PTE LTD; 21 Gul Lane, Jurong Town, Singapore 629416

NALCO INDUSTRIAL SERVICES (THAILAND) CO., LTD; Rayong Plant, 109/19 M00 4, Eastern Seaboard Industrial Estate, Soi ESIE 6, T. Pluakdaeng, A. Pluakdaeng Rayong 21140 Thailand

EMERGENCY TELEPHONE NUMBER(S):

CHINA:	512-68255001
KOREA:	02-789-6961
INDIA:	0-33-6740395
INDONESIA:	62-21-8753175
MALAYSIA:	603-5569 4118
THE PHILIPPINES:	63-49-5451550
SINGAPORE:	65-6861-4011
THAILAND:	38-955-160

Prepared By Nalco Asia Pacific SHE, Product Safety Specialist

Date issued: 16-Nov-06

Replaces: 4-Apr-06

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : **TOWERBROM® 991**APPLICATION : **MICROBIOCIDES**COMPANY IDENTIFICATION : **Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198****EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC****NFPA 704M/HMIS RATING****HEALTH : 3 / 3 FLAMMABILITY : 0 / 0 INSTABILITY : 2 / 2 OTHER : OXIDIZER**
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Trichloro-S-Triazinetrione	87-90-1	60.0 - 100.0
Sodium Bromide	7647-15-6	5.0 - 10.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******DANGER****CORROSIVE. CAUSES EYE AND SKIN DAMAGE. IRRITATING TO NOSE AND THROAT. HARMFUL OR FATAL IF SWALLOWED.** Prolonged ingestion of large amounts may cause adverse central nervous system effects.
Strong Oxidizer.

Do not get in eyes, on skin, on clothing. Remove contaminated clothing and wash before reuse.

Wear goggles and face shield and rubber gloves when handling.

Not flammable but can act as an oxidizing agent, enhancing the burning rate of other materials. Water Reactive; material will react with water and may release a flammable or toxic gas. In addition, nitrogen trichloride, which can present an explosion hazard, can be generated slowly by the reaction of small quantities of water with a high concentration of this product. Decomposes; flammable and/or toxic gases will form at elevated temperatures (thermal decomposition).

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****HUMAN HEALTH HAZARDS - ACUTE :****EYE CONTACT :**

Severely irritating. If not removed promptly, will injure eye tissue and may result in permanent eye damage.

SKIN CONTACT :

May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered.

INGESTION :

Not a likely route of exposure. Harmful if swallowed. May cause mucosal damage.

INHALATION :

Not a likely route of exposure. Irritating, in high concentrations, to the eyes, nose, throat and lungs.

SYMPTOMS OF EXPOSURE :**Acute :**

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

Excessive exposure may cause central nervous system effects, nausea, vomiting, anesthetic or narcotic effects.

AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES**EYE CONTACT :**

Get immediate medical attention. **PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT.** Immediately flush eye with water for at least 15 minutes while holding eyelids open.

SKIN CONTACT :

Remove contaminated clothing. Wash off affected area immediately with plenty of water. Get immediate medical attention.

INGESTION :

Get immediate medical attention. **DO NOT INDUCE VOMITING.** If conscious, washout mouth and give water to drink.

INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :

Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****5. FIRE FIGHTING MEASURES****FLASH POINT :** None**EXTINGUISHING MEDIA :**

Use water spray to cool containers exposed to fire and massive quantities of water to dilute material involved in a fire or spilled from containers. Do not use ABC or other dry chemical fire extinguishers since there is the potential for a violent reaction.

FIRE AND EXPLOSION HAZARD :

Not flammable but can act as an oxidizing agent, enhancing the burning rate of other materials. Water Reactive; material will react with water and may release a flammable or toxic gas. In addition, nitrogen trichloride, which can present an explosion hazard, can be generated slowly by the reaction of small quantities of water with a high concentration of this product. Decomposes; flammable and/or toxic gases will form at elevated temperatures (thermal decomposition).

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES**PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ensure adequate ventilation. Do not touch spilled material. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

Sweep up and shovel. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations). DO NOT allow water to come into contact with this material.

ENVIRONMENTAL PRECAUTIONS :

This product is toxic to fish. Do not discharge effluent containing this active ingredient into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

7. HANDLING AND STORAGE**HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating dusts. Keep the containers closed when not in use.

STORAGE CONDITIONS :

Store the containers tightly closed. Store in suitable labeled containers. Store separately from bases. Keep in dry place. Store away from organic chemicals and other oxidizable materials, reducing agents, acids and alkalis. DO NOT allow water to come into contact with this material.

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS :**

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

ACGIH/TLV :**Substance(s)**

Chlorine

TWA: 0.5 ppm , 1.5 mg/m³STEL: 1 ppm , 2.9 mg/m³**OSHA/PEL :****Substance(s)**

Chlorine

TWA: 0.5 ppm , 1.5 mg/m³STEL: 1 ppm , 3 mg/m³**Manufacturer's Recommendation :****Substance(s)**

Trichloro-S-Triazinetrione

TWA: 0.5 mg/m³STEL: 1.5 mg/m³**ENGINEERING MEASURES :**

General ventilation is recommended. Local exhaust ventilation may be necessary when dusts or mists are generated.

RESPIRATORY PROTECTION :

If dusts are generated, use an approved air-purifying respirator. An organic vapor/acid gas cartridge with dust/mist prefilter may be used. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :

Neoprene gloves, PVC gloves, Butyl gloves

SKIN PROTECTION :

Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :

Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :

Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****9. PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE	Tablet
APPEARANCE	White
ODOR	Slight Pungent, Halogen
SOLUBILITY IN WATER	Moderate
pH (1 %)	3.0 - 3.5
MELTING POINT	Decomposes / > 225 °C
VOC CONTENT	0.0 %

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY**STABILITY :**

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Moisture

Avoid temperatures greater than 400 °F

MATERIALS TO AVOID :

Do not bring in contact with organic materials and reducing agents. DO NOT allow water to come into contact with this material.

HAZARDOUS DECOMPOSITION PRODUCTS :

Oxides of nitrogen (NO_x), disodium oxide, bromine, and traces of phosgene (under fire conditions); chlorine (released in presence of moisture) and other chlorine containing compounds; hypobromous acid, hypochlorous acid, and cyanuric acid (released when dissolved in water); nitrogen trichloride, an explosion hazard (generated slowly by the reaction of small quantities of water with high concentration of this product).

11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

ACUTE ORAL TOXICITY :

Species LD50
Rat 840 mg/kg
Rating : Non-Hazardous

Test Descriptor
Hazardous component Trichloro-S-Triazinetrione

**MATERIAL SAFETY DATA SHEET****PRODUCT****TOWERBROM® 991****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****ACUTE DERMAL TOXICITY :**

Species LD50
Rabbit > 5,000 mg/kg
Rating : Non-Hazardous

Test Descriptor

Hazardous component Trichloro-S-Triazinetrione

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL EFFECTS :**

The following results are for the active components.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Bluegill Sunfish	96 hrs	0.4 mg/l	(Trichloro-S-Triazinetrione)
Rainbow Trout	96 hrs	0.24 mg/l	(Trichloro-S-Triazinetrione)
Fathead Minnow	48 hrs	0.7 mg/l	50% Active Ingredient
Inland Silverside	96 hrs	2.7 mg/l	50% Active Ingredient

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	0.21 mg/l		(Trichloro-S-Triazinetrione)
Mysid Shrimp (Mysidopsis bahia)	96 hrs	4.4 mg/l		50% Active Ingredient

ADDITIONAL ECOLOGICAL DATA:

Product contains organic halogens, may contribute to AOX.

BIOACCUMULATION POTENTIAL

The product will not bioaccumulate.

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D001, D003

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Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	TRICHLOROISOCYANURIC ACID, DRY, MIXTURE
Technical Name(s) :	Trichloro-S-Triazinetrione
UN/ID No :	UN 2468
Hazard Class - Primary :	5.1
Packing Group :	II
Flash Point :	None

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	TRICHLOROISOCYANURIC ACID, DRY, MIXTURE
Technical Name(s) :	Trichloro-S-Triazinetrione
UN/ID No :	UN 2468
Hazard Class - Primary :	5.1
Packing Group :	II
IATA Cargo Packing Instructions :	511
IATA Cargo Aircraft Limit :	25 KG (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	TRICHLOROISOCYANURIC ACID, DRY, MIXTURE
Technical Name(s) :	Trichloro-S-Triazinetrione
UN/ID No :	UN 2468
Hazard Class - Primary :	5.1
Packing Group :	II

15. REGULATORY INFORMATION**NATIONAL REGULATIONS, USA :**

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Trichloro-S-Triazinetrione : Oxidizer, Eye irritant, Respiratory irritant



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Sodium Bromide : Eye irritant

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
X	Fire Hazard
-	Sudden Release of Pressure Hazard
X	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :

NSF Registration number for this product is : 138722

This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas.

FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA) :

EPA Reg. No. 935-75-1706

In all cases follow instructions on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

None of the substances are specifically listed in the regulation.



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CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :

This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :

None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :

This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

Pesticide controlled products are not regulated under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

Substances regulated under the Pest Control Products Act are exempt from CEPA New Substance Notification requirements.

16. OTHER INFORMATION

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.



MATERIAL SAFETY DATA SHEET

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(800) 424-9300 (24 Hours) CHEMTREC

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department

Date issued : 08/28/2006

Version Number : 1.8

**VPDES General Permit Registration Statement
Industrial Activity Storm Water Discharges (VAR05)**

(Please Type or Print All Information)

1a. Property Owner of the Facility Site

Name: Merck Sharp & Dohme Corp. a division of Merck & Co., Inc.

Mailing Address: One Merck Drive

City: Whitehouse Station State: NJ Zip: 08889 Phone: (908) 423-1000

E-Mail Address (where available): _____

1b. Operator Applying For Permit Coverage (if different than "1a")

Name: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

E-Mail Address (where available): _____

1c. Responsible Party Requesting Permit Coverage, and Who Will Be Legally Responsible For Compliance With This Permit

Name: Mr. Craig P. Kennedy

Mailing Address: 2778 South Eastside Highway

City: Elkton State: VA Zip: 22817 Phone: (540) 298-4100

E-Mail Address (where available): craig_kennedy@merck.com

2. Facility Information

Facility Name: Merck Sharp & Dohme Corp. - Stonewall Plant

Address: 2778 South Eastside highway

City: Elkton State: VA Zip: 22827

County Name: Rockingham

Contact Name: Mr. John A. McCloskey Phone: 540-298-4122

E-Mail Address (where available): john.mccloskey@merck.com

3. Facility Ownership Status: Federal ☐ State ☐ Public ☐ Private ☒ (Check one only)

4. Name(s) of the receiving water(s) that storm water is discharged into: South Fork Shenandoah river

5. If the discharge is through a municipal separate storm sewer system (MS4), the name of the municipal operator of the storm sewer: n/a

Additional notification for discharges to MS4s. If the facility's storm water discharges are through an MS4, the owner must notify the operator of the municipal system receiving the discharge, and submit a copy of their registration statement to the municipal system operator.

6. VPDES Permit Numbers for all permits assigned to the facility: VA0002178

7. Attach a copy of the general location map from the SWPPP and the site map from the SWPPP.
8. Identify up to four 4-digit Standard Industrial Classification (SIC) Codes or 2-letter Industrial Activity Codes that best represent the principal products or services rendered by the facility and major co-located activities.

4-Digit SIC Codes or 2-letter Industrial Activity Codes: LF _____

(The 2-letter Industrial Activity Codes are: **HZ** - hazardous waste treatment, storage, or disposal facilities; **LF** - landfills/disposal facilities that receive or have received any industrial wastes; **SE** - steam electric power generating facilities; or, **TW** - treatment works treating domestic sewage)

9. Attach a list identifying all applicable industrial sectors (see instructions) that cover the discharges associated with industrial activity from the facility and from any co-located industrial activities that will be covered under this permit. Also identify the storm water outfalls associated with each identified sector.

In addition to attaching the list, answer the questions below as they apply to the facility's discharges:

- For landfills, indicate the type of landfill: Outfall 002: Sanitary Landfill closed in year 2000.

- For timber products operations, indicate which outfalls (if any) receive discharges from wet decking areas:

n/a

- For all facilities, indicate which outfalls (if any) receive discharges from coal storage piles:

n/a

- For asphalt paving and roofing materials manufacturers, indicate which outfalls (if any) receive discharges from areas where production of asphalt paving and roofing emulsions occurs:

n/a

- For cement manufacturing facilities, indicate which outfalls (if any) receive discharges from material storage piles:

n/a

10. **Certification:** "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Print Name Craig P. Kennedy Title: Vice President & Plant Manager

Signature:  for C. Kennedy Date: 01. JUL. 2011

11. **Would you like your permit sent to you electronically?** Yes ☐ No ☒

If "Yes", please list the email address to send it to:

Note: Merck is not requesting coverage under VAR05. Outfall 002 is the sole storm water-only outfall associated with industrial activity. It is permitted under VA0002178.

For Department of Environmental Quality Use Only

Accepted/Not Accepted by: _____ Date: _____

Basin _____ Stream Class _____ Section _____ Special Standards _____

Antidegradation Checked? Yes ☐ No ☐ Is The Discharge to Impaired Waters? Yes ☐ No ☐

Has a TMDL been established? Yes ☐ No ☐ N/A ☐ Is the TMDL EPA approved? Yes ☐ No ☐ N/A ☐

VPDES Permit Application Addendum

1. **Entity to whom the permit is to be issued:** Merck Sharp & Dohme Corp. – Stonewall Plant

Who will be legally responsible for the wastewater treatment facilities and compliance with the permit? This may or may not be the facility or property owner.

2. **Is this facility located within city or town boundaries?** Yes ☒ No ☐

3. **Provide the tax map parcel number for the land where the discharge is located.** 130-8-L2

4. **For the facility to be covered by this permit, how many acres will be disturbed during the next five years due to new construction activities?** < 10 acres

5. **What is the design average effluent flow of this facility?** 1.2 MGD

For industrial facilities, provide the max. 30-day average production level, include units:

max monthly average COD = 1194 kg/day

In addition to the design flow or production level, should the permit be written with limits for any other discharge flow tiers or production levels? Yes ☐ No ☒

If "Yes", please identify the other flow tiers (in MGD) or production levels:

Please consider the following questions for both the flow tiers and the production levels (if applicable): Do you plan to expand operations during the next five years? Is your facility's design flow considerably greater than your current flow?

6. **Nature of operations generating wastewater:**

Medicinal chemicals and Pharmaceutical Operations

15 % of flow from domestic connections/sources

Number of private residences to be served by the treatment works: none

85 % of flow from non-domestic connections/sources

7. **Mode of discharge:** ☒ Continuous ☐ Intermittent ☐ Seasonal

Describe frequency and duration of intermittent or seasonal discharges:

8. **Identify the characteristics of the receiving stream at the point just above the facility's discharge point:**

☒ Permanent stream, never dry

☐ Intermittent stream, usually flowing, sometimes dry

☐ Ephemeral stream, wet-weather flow, often dry

☐ Effluent-dependent stream, usually or always dry without effluent flow

☐ Lake or pond at or below the discharge point

☐ Other:

9. **Approval Date(s):**

O & M Manual 16-May-2011

Sludge/Solids Management Plan 16-May-2011

Have there been any changes in your operations or procedures since the above approval dates? Yes ☐ No ☒

PUBLIC NOTICE BILLING INFORMATION

I hereby authorize the Department of Environmental Quality to have the cost of publishing a public notice billed to the Agent/Department shown below. The public notice will be published once a week for two consecutive weeks in Daily News Record in accordance with 9 VAC 25-31-290.C.2.

Agent/Department to be billed: Plant Manager

Owner: Merck Sharp & Dohme Corp.

Agent/Department Address: 2778 South Eastside Highway

Elkton, VA 22827

Agent's Telephone No.: 540-298-4100

Printed Name: Craig P. Kennedy

Authorizing Agent – Signature: C. Kennedy for C. Kennedy

Date: 01. JUL. 2011

VPDES Permit No. VA0002178

Facility Name: Merck Sharp & Dohme Corp.

RECEIVED
DEQ - Valley
JUL 05 2011
To: _____
FILE: _____

**VPDES/VPA Permit Billing Information Form
For Annual Maintenance Fee**

Facility Name: Merck Sharp & Dohme Corp. –
Stonewall Plant

Facility Address: 2778 South East Side Highway
Elkton, VA 22827

Permit Number: VA0002178

Owner Name: Merck Sharp & Dohme Corp.
A division of Merck & Co., Inc.

Owner Address: One Merck Drive
Whitehouse Station, NJ 0889

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM

SCREENING INFORMATION

This application is divided into four sections. Section A pertains to all applicants. The applicability of Sections B, C and D depends on your facility's sewage sludge use or disposal practices. The information provided on this page will help you determine which sections to fill out.

1. All applicants must complete Section A (General Information).

2. Does this facility generate sewage sludge? ☒ Yes ☐ No

Does this facility derive a material from sewage sludge? ☐ Yes ☒ No

If you answered "Yes" to either, complete Section B (Generation Of Sewage Sludge or Preparation Of A Material Derived From Sewage Sludge).

3. Does this facility apply sewage sludge to the land? ☐ Yes ☒ No

Is sewage sludge from this facility applied to the land? ☐ Yes ☒ No

If you answer "No" to all above, skip Section C.

If you answered "Yes" to either, answer the following three questions:

a. Does the sewage sludge from this facility meet the ceiling concentrations, pollutant concentrations, Class A pathogen reduction requirements and one of the vector attraction reduction requirements 1-8, as identified in the instructions?
☐ Yes ☐ No

b. Is sewage sludge from this facility placed in a bag or other container for sale or give-away for application to the land?
☐ Yes ☐ No

c. Is sewage sludge from this facility sent to another facility for treatment or blending? ☐ Yes ☐ No

If you answered "No" to all three, complete Section C (Land Application Of Bulk Sewage Sludge).

If you answered "Yes" to a, b or c, skip Section C.

4. Do you own or operate a surface disposal site? ☐ Yes ☒ No

If "Yes", complete Section D (Surface Disposal).

RECEIVED
DEQ - Valley
JUL 05 2011
To: _____
By: _____

SECTION A. GENERAL INFORMATION

All applicants must complete this section.

1. Facility Information.

- a. Facility name: Merck Sharp & Dohme Corp. – Stonewall Plant
- b. Contact person: John A. McCloskey
Title: Environmental Manager
Phone: (540) 298-4122
- c. Mailing address:
Street or P.O. Box: 2778 South Eastside Highway
City or Town: Elkton State: VA Zip: 22827
- d. Facility location:
Street or Route #: 2778 South Eastside Highway
County: Rockingham
City or Town: Elkton State: VA Zip: 22827
- e. Is this facility a Class I sludge management facility? Yes ☒ No
- f. Facility design flow rate: 0.15 mgd
- g. Total population served: 700 (personnel working on site)
- h. Indicate the type of facility:
☐ Publicly owned treatment works (POTW)
☐ Privately owned treatment works
☐ Federally owned treatment works
☐ Blending or treatment operation
☐ Surface disposal site
☒ Other (describe): Industrial wastewater treatment plant to treat the plant wastewater

2. Applicant Information. If the applicant is different from the above, provide the following:

- a. Applicant name: Merck Sharp & Dohme Corp. – Stonewall Plant
- b. Mailing address:
Street or P.O. Box: 2778 South Eastside Highway
City or Town: Elkton State: VA Zip: 22827
- c. Contact person: John McCloskey
Title: Environmental Manager
Phone: (540) 298-4122
- d. Is the applicant the owner or operator (or both) of this facility?
☒ owner ☒ operator
- e. Should correspondence regarding this permit be directed to the facility or the applicant?
☒ facility ☐ applicant

3. Permit Information.

- a. Facility's VPDES permit number (if applicable): VA0002178
- b. List on this form or an attachment, all other federal, state or local permits or construction approvals received or applied for that regulate this facility's sewage sludge management practices:
- | | |
|---------------------|--------------------------------------|
| Permit Number: | Type of Permit: |
| <u>VAD001705110</u> | <u>RCRA – Hazardous waste permit</u> |
| <u>VRO080524</u> | <u>Title V air permit</u> |

4. **Indian Country.** Does any generation, treatment, storage, application to land or disposal of sewage sludge from this facility occur in Indian Country? ____ Yes ____X__ No If "Yes", describe:
5. **Topographic Map.** Provide a topographic map or maps (or other appropriate maps if a topographic map is unavailable) that shows the following information. Maps should include the area one mile beyond all property boundaries of the facility: See VPDES Permit Application – Appendix I
- Location of all sewage sludge management facilities, including locations where sewage sludge is generated, stored, treated, or disposed.
 - Location of all wells, springs, and other surface water bodies listed in public records or otherwise known to the applicant within 1/4 mile of the property boundaries.
6. **Line Drawing.** Provide a line drawing and/or a narrative description that identifies all sewage sludge processes that will be employed during the term of the permit including all processes used for collecting, dewatering, storing, or treating sewage sludge, the destination(s) of all liquids and solids leaving each unit, and all methods used for pathogen reduction and vector attraction reduction. Process description is attached -
7. **Contractor Information.** Are any operational or maintenance aspects of this facility related to sewage sludge generation, treatment, use or disposal the responsibility of a contractor? ____ Yes ____X__ No
If "Yes", provide the following for each contractor (attach additional pages if necessary).

Name: _____

Mailing address:

Street or P.O. Box: _____

City or Town: _____ State: _____ Zip: _____

Phone: (_____) _____

Contractor's Federal, State or Local Permit Number(s) applicable to this facility's sewage sludge:

If the contractor is responsible for the use and/or disposal of the sewage sludge, provide a description of the service to be provided to the applicant and the respective obligations of the applicant and the contractor(s).

8. **Pollutant Concentrations.** Using the table below or a separate attachment, provide sewage sludge monitoring data for the pollutants which limits in sewage sludge have been established in 9 VAC 25-31-10 et seq. for this facility's expected use or disposal practices. All data must be based on three or more samples taken at least one month apart and must be no more than four and one-half years old. Not Applicable.

POLLUTANT	CONCENTRATION (mg/kg dry weight)	SAMPLE DATE	ANALYTICAL METHOD	DETECTION LEVEL FOR ANALYSIS
Arsenic				
Cadmium				
Chromium				
Copper				
Lead				
Mercury				
Molybdenum				
Nickel				
Selenium				
Zinc				

9. **Certification.** Read and submit the following certification statement with this application. Refer to the instructions to determine who is an officer for purposes of this certification. Indicate which parts of the application you have completed and are submitting:

X Section A (General Information)

X Section B (Generation of Sewage Sludge or Preparation of a Material Derived from Sewage Sludge)

Section C (Land Application of Bulk Sewage Sludge)

Section D (Surface Disposal)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name and official title Craig M. Kennedy, Vice President & Plant Manager

Signature C. J. Jorison for C. Kennedy Date Signed 01. Jul. 2011

Telephone number (540) 298-4100

Upon request of the department, you must submit any other information necessary to assess sewage sludge use or disposal practices at your facility or identify appropriate permitting requirements.

**SECTION B. GENERATION OF SEWAGE SLUDGE OR PREPARATION
OF A MATERIAL DERIVED FROM SEWAGE SLUDGE**

Complete this section if your facility generates sewage sludge or derives a material from sewage sludge

1. Amount Generated On Site.

Total dry metric tons per 365-day period generated at your facility: 2 dry metric tons

2. Amount Received from Off Site. If your facility receives sewage sludge from another facility for treatment, use or disposal, provide the following information for each facility from which sewage sludge is received. If you receive sewage sludge from more than one facility, attach additional pages as necessary. None.

- a. Facility name: _____
- b. Contact Person: _____
Title: _____
Phone: (_____) _____
- c. Mailing address: _____
Street or P.O. Box: _____
City or Town: _____ State: _____ Zip: _____
- d. Facility location: _____
(not P.O. Box) _____
- e. Total dry metric tons per 365-day period received from this facility: _____ dry metric tons
- f. Describe, on this form or on another sheet of paper, any treatment processes known to occur at the off-site facility, including blending activities and treatment to reduce pathogens or vector attraction characteristics:

3. Treatment Provided at Your Facility.

- a. Which class of pathogen reduction is achieved for the sewage sludge at your facility?
 Class A Class B X **Neither or unknown**
- b. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce pathogens in sewage sludge: Dried sludge

- c. Which vector attraction reduction option is met for the sewage sludge at your facility?
 Option 1 (Minimum 38 percent reduction in volatile solids)
 Option 2 (Anaerobic process, with bench-scale demonstration)
 Option 3 (Aerobic process, with bench-scale demonstration)
 Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
 Option 5 (Aerobic processes plus raised temperature)
 Option 6 (Raise pH to 12 and retain at 11.5)
 Option 7 (75 percent solids with no unstabilized solids)
 Option 8 (90 percent solids with unstabilized solids)
 X **None or unknown**
- d. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce vector attraction properties of sewage sludge: None

- e. Describe, on this form or another sheet of paper, any other sewage sludge treatment activities, including blending, not identified in a - d above:
None

4. Preparation of Sewage Sludge Meeting Ceiling and Pollutant Concentrations, Class A Pathogen Requirements and One of Vector Attraction Reduction Options 1-8 (EQ Sludge).

(If sewage sludge from your facility does not meet all of these criteria, skip Question 4.)

- a. Total dry metric tons per 365-day period of sewage sludge subject to this section that is applied to the land:

_____ dry metric tons

- b. Is sewage sludge subject to this section placed in bags or other containers for sale or give-away?

_____ Yes _____ No

5. Sale or Give-Away in a Bag or Other Container for Application to the Land.

(Complete this question if you place sewage sludge in a bag or other container for sale or give-away prior to land application. Skip this question if sewage sludge is covered in Question 4.)

- a. Total dry metric tons per 365-day period of sewage sludge placed in a bag or other container at your facility for

sale or give-away for application to the land: _____ dry metric tons

- b. Attach, with this application, a copy of all labels or notices that accompany the sewage sludge being sold or given away in a bag or other container for application to the land.

6. Shipment Off Site for Treatment or Blending.

(Complete this question if sewage sludge from your facility is sent to another facility that provides treatment or blending. This question does not apply to sewage sludge sent directly to a land application or surface disposal site. Skip this question if the sewage sludge is covered in Questions 4 or 5. If you send sewage sludge to more than one facility, attach additional sheets as necessary.) Less than 2 metric tons of sanitary sludge on dry basis.

- a. Receiving facility name: _____ Harrisonburg-Rockingham Regional Sewer Authority _____

- b. Facility contact: _____ Sharon Foley_P.E. _____

Title: _____ Executive _____ Director _____

Phone: (540) 434-1053 Ext.223 _____

- c. Mailing address:

Street or P.O. Box: _____ P.O. Box 8, 856 North River Road _____

City or Town: _____ Mt. Crawford _____ State: _____ VA _____ Zip: _____ 22841 _____

- d. Total dry metric tons per 365-day period of sewage sludge provided to receiving facility:

_____ 2 _____ dry metric tons

- e. List, on this form or an attachment, the receiving facility's VPDES permit number as well as the numbers of all other federal, state or local permits that regulate the receiving facility's sewage sludge use or disposal practices:

Permit Number:

Type of Permit:

_____ n/a _____

_____ VPDES permit _____

- f. Does the receiving facility provide additional treatment to reduce pathogens in sewage sludge from your facility?

_____ X _____ Yes _____ No

Which class of pathogen reduction is achieved for the sewage sludge at the receiving facility?

_____ Class A _____ Class B _____ X _____ Neither or unknown

Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce

pathogens in sewage sludge: _____ not

available _____

- g. Does the receiving facility provide additional treatment to reduce vector attraction characteristics of the sewage sludge? _____ Yes _____ No (no information available)

Which vector attraction reduction option is met for the sewage sludge at the receiving facility?

- ☐ Option 1 (Minimum 38 percent reduction in volatile solids)
☐ Option 2 (Anaerobic process, with bench-scale demonstration)
☐ Option 3 (Aerobic process, with bench-scale demonstration)
☐ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)
☐ Option 5 (Aerobic processes plus raised temperature)
☐ Option 6 (Raise pH to 12 and retain at 11.5)
☐ Option 7 (75 percent solids with no unstabilized solids)
☐ Option 8 (90 percent solids with unstabilized solids)
☒ X None unknown

Describe, on this form or another sheet of paper, any treatment processes used at the receiving facility to reduce vector attraction properties of sewage sludge: not available

- h. Does the receiving facility provide any additional treatment or blending not identified in f or g above?
☐ Yes ☒ X No

If "Yes", describe, on this form or another sheet of paper, the treatment processes not identified in f or g above:

- i. If you answered "Yes" to f, g or h above, attach a copy of any information you provide to the receiving facility to comply with the "notice and necessary information" requirement of 9 VAC 25-31-530.G.
- j. Does the receiving facility place sewage sludge from your facility in a bag or other container for sale or give-away for application to the land? ☐ Yes ☒ X No
- If "Yes", provide a copy of all labels or notices that accompany the product being sold or given away.
- k. Will the sewage sludge be transported to the receiving facility in a truck-mounted watertight tank normally used for such purposes? ☒ X Yes ☐ No. If "No", provide description and specification on the vehicle used to transport the sewage sludge to the receiving facility.

Show the haul route(s) on a location map or briefly describe the haul route below and indicate the days of the week and the times of the day sewage sludge will be transported. See attached communication

7. Land Application of Bulk Sewage Sludge.

(Complete Question 7.a if sewage sludge from your facility is applied to the land, unless the sewage sludge is covered in Questions 4, 5 or 6. Complete Question 7.b, c & d only if you are responsible for land application of sewage sludge.)

- a. Total dry metric tons per 365-day period of sewage sludge applied to all land application sites:
 dry metric tons

- b. Do you identify all land application sites in Section C of this application? ☐ Yes ☐ No

If "No", submit a copy of the Land Application Plan (LAP) with this application (LAP should be prepared in accordance with the instructions).

- c. Are any land application sites located in States other than Virginia? ☐ Yes ☐ No

If "Yes", describe, on this form or on another sheet of paper, how you notify the permitting authority for the States where the land application sites are located. Provide a copy of the notification.

- d. Attach a copy of any information you provide to the owner or lease holder of the land application sites to comply with the "notice and necessary" information requirement of 9 VAC 25-31-530 F and/or H (Examples may be obtained in Appendix IV).

8. Surface Disposal.

(Complete Question 8 if sewage sludge from your facility is placed on a surface disposal site.)

- a. Total dry metric tons per 365-day period of sewage sludge from your facility placed on all surface disposal sites: _____ dry metric tons

- b. Do you own or operate all surface disposal sites to which you send sewage sludge for disposal?
____ Yes ____ No

If "No", answer questions c - g for each surface disposal site that you do not own or operate. If you send sewage sludge to more than one surface disposal site, attach additional pages as necessary.

- c. Site name or number: _____
- d. Contact person: _____
Title: _____
Phone: (_____) _____
Contact is: ____ Site Owner ____ Site operator
- e. Mailing address:
Street or P.O. Box: _____
City or Town: _____ State: _____ Zip: _____
- f. Total dry metric tons per 365-day period of sewage sludge from your facility placed on this surface disposal site: _____ dry metric tons
- g. List, on this form or an attachment, the surface disposal site VPDES permit number as well as the numbers of all other federal, state or local permits that regulate the sewage sludge use or disposal practices at the surface disposal site:
Permit Number: _____ Type of Permit: _____

9. Incineration.

(Complete Question 9 if sewage sludge from your facility is fired in a sewage sludge incinerator.)

- a. Total dry metric tons per 365-day period of sewage sludge from your facility fired in a sewage sludge incinerator: _____ dry metric tons

- b. Do you own or operate all sewage sludge incinerators in which sewage sludge from your facility is fired?
____ Yes ____ No

If "No", answer questions c - g for each sewage sludge incinerator that you do not own or operate. If you send sewage sludge to more than one sewage sludge incinerator, attach additional pages as necessary.

- c. Incinerator name or number: _____
- d. Contact person: _____
Title: _____
Phone: (_____) _____
Contact is: ____ Incinerator Owner ____ Incinerator Operator
- e. Mailing address:
Street or P.O. Box: _____
City or Town: _____ State: _____ Zip: _____
- f. Total dry metric tons per 365-day period of sewage sludge from your facility fired in this sewage sludge incinerator: _____ dry metric tons
- g. List on this form or an attachment the numbers of all other federal, state or local permits that regulate the firing

of sewage sludge at this incinerator:

Permit Number: _____

Type of Permit: _____

10. Disposal in a Municipal Solid Waste Landfill.

(Complete Question 10 if sewage sludge from your facility is placed on a municipal solid waste landfill. Provide the following information for each municipal solid waste landfill on which sewage sludge from your facility is placed. If sewage sludge is placed on more than one municipal solid waste landfill, attach additional pages as necessary.)

a. Landfill name: _____

b. Contact person: _____

Title: _____

Phone: (____) _____

Contact is: _____ Landfill Owner _____ Landfill Operator

c. Mailing address:

Street or P.O. Box: _____

City or Town: _____ State: VA Zip: _____

d. Landfill location.

Street or Route #: _____

County: _____

City or Town: _____ State: VA Zip: _____

e. Total dry metric tons per 365-day period of sewage sludge placed in this municipal solid waste landfill:

_____ dry metric tons

f. List, on this form or an attachment, the numbers of all federal, state or local permits that regulate the operation of this municipal solid waste landfill:

Permit Number: _____

Type of Permit: _____

g. Does sewage sludge meet applicable requirements in the Virginia Solid Waste Management Regulation, 9 VAC 20-80-10 et seq., concerning the quality of materials disposed in a municipal solid waste landfill?

____ Yes ____ No

h. Does the municipal solid waste landfill comply with all applicable criteria set forth in the Virginia Solid Waste Management Regulation, 9 VAC 20-80-10 et seq.? ____ Yes ____ No

i. Will the vehicle bed or other container used to transport sewage sludge to the municipal solid waste landfill be watertight and covered? ____ Yes ____ No

Show the haul route(s) on a location map or briefly describe the route below and indicate the days of the week and time of the day sewage sludge will be transported. Elkton to Harrisonburg via Rt. 340 & Rt.33

Maximum 1/week (see attached) _____

Sections C and D are not applicable to this facility and are not included.

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM

Attachment 1

Merck Sharp & Dohme Corp. – Stonewall Plant

Sanitary Waste Treatment Plant Description

6.0 SANITARY WASTEWATER TREATMENT SYSTEM

6.1 General

All sanitary wastewater is conveyed to the wastewater treatment plant in gravity sewers separate from the plant chemical sewers. The sanitary waste flows by gravity to the comminutor/ bar screen basin where solids are macerated or captured. It then flows through a lift station and into aeration chambers. The sanitary activated sludge MLSS is then clarified and chlorinated before combining with the chemical sewer influent to the wastewater treatment plant. The sanitary treatment systems consist of the following unit processes:

- Comminutor/ bar screen
- Lift station with dual lift pumps and a spare air pump
- Dual- path, extended aeration treatment package, by U.S. Filter designed to treat an average of 150,000 gallons per day
- Chlorine addition and monitoring equipment
- Three 345 CFM blowers

6.2 Sanitary Process Description

The sanitary treatment plant (STP) is designed to treat 150,000 gallons/day, with a maximum flow of 275,000 GPD and maximum flowrate of 190 gallons/minute. All sanitary waste passes through the inlet comminutor or bar screen. Waste enters a lift station (TA-300) with dual lift pumps that deliver the wastewater to the above ground STP package unit. If electrical power to these lift pumps fails, an emergency generator system is available. Also, an emergency 3" air-diaphragm pump is available to pump sanitary waste to the STP.

The dual path, field-erected STP by U.S. Filter (Davis Products Co.) is a package unit cylindrical steel tank of 52' 10" outer wall diameter and 16' 6" height (see Figure 6.1). The unit is arranged in a pie fashion with two large portions as aeration basins, two smaller portions as clarifiers, and a small portion as the chlorine contact chamber (8,297 gallons). A 37,947 gallon aerobic digester is placed in the center.

Three 345 CFM blowers provide air to the STP for aeration of the basins and vacuum removal of sludge and scum from the clarifiers.

Once sanitary waste is pumped up to the influent splitter box, the unit uses gravity flow to move the waste through the dual paths of extended aeration and clarification. Each path is rated for an average 75,000 gallons per day, displacing the volume of the each aeration basin. Each of the two 75,000 gallon aeration basins have non-clog, coarse bubble

diffusers that provide dissolved oxygen to the decomposing microbes in the liquid waste and mixes the waste in the basin.

After aeration treatment, the MLSS is transferred to the clarifier units in the STP package. The 24,048 gallon clarifiers are equipped with electrically powered traveling boom assemblies and 19.3 linear feet of toothed weir around the outside circumference of the clarifier, see Figure 6.1. MLSS feeds by gravity through the clarifier splitter box and into the clarifier. The clarifier boom slowly moves back and forth, removing solids from the bottom and scum from the top of the clarifier. The boom assembly is equipped with air eductors that remove sludge from the bottom of the clarifier and scum from suction cups near the liquid surface. The sludge and scum are transferred to the aerobic digester for further decomposition and storage. Clarifier effluent flows by gravity through a chlorine contact chamber.

The chlorine contact chamber has a series of baffles that force the effluent to flow in an over and under pattern providing a 27:1 ratio (length to width). The effluent is retained in the chlorine contact chamber for 43 minutes at the maximum design flow of 190 gpm. The chlorinated effluent flow is measured through a 90° weir at the exit of the chlorine contact chamber before flowing to the influent of the industrial wastewater collection system of the plant. The residual chlorine of this effluent is tested at least as frequent as specified in the VPDES permit.

The 37,947 gallon aerobic digester receives sludge and scum from the clarifier traveling boom return system. Sludge is wasted from the system to maintain adequate microbial populations in the aeration basins and good settling in the clarifiers. About once a month, digester aeration is stopped to allow the solids to concentrate toward the bottom. The supernatant liquid is transferred to the aeration basins. Once the digester sludge is concentrated above 6,000 to 10,000 mg/L, it is removed and disposed of at a regional wastewater treatment plant.

6.3 Sanitary System Design Criteria

Comminutor Channel/ System

Comminutor ½ hp Muffin Monster

Main Sanitary Lift Station (TA-300):

Capacity - design	150,000 gallons per day (104 GPM, avg.)
Size	10 feet x 10 feet
Side water depth	9 feet
Hydraulic retention time- design	1 hour
Pumps- dual	2" X 3" vertical, centrifugal, no-clog design
Capacity per pump	150 GPM at 30' TDH
Motor- per pump	3 HP
Emergency pump, installed	3" air operated diaphragm pump; 150GPM
Level alarms	High level: Local and at main Control room

Back-up electrical system for pumps	45 KW
<u>Aeration Basin (per Dual path)</u>	
Volume and rated capacity per day	75,000 gallons
Side water depth	15 feet
Diffusers per basin	3 sets of 3; non-clog, coarse bubble design
Air requirements, at design	514 CFM
<u>Air Blowers</u>	
Quantity	3, with common discharge manifold
Capacity	345 CFM @ 8 psig
Motor	20 hp, 1800 RPM, 460/ 60/3
<u>Clarifier (per Dual path)</u>	
Volume	24,048 gallons
Detention time at design flow	7.7 hours
Weir length- effective	19.3 linear feet
Weir overflow rate- at design flow	3,874 gallons/ linear ft./ day
Surface area	214 square feet
Surface settling rate- at design flow	350 gallons/ square foot/ day
Surface scum cups	3
<u>Chlorine contact chamber (common both Trains)</u>	
Capacity	8,297 gallons
Baffles	Over and under; providing 27:1 ratio(L to W)
Calculated retention time @max. influent	43 minutes, at 190 gpm
<u>Chlorination Systems</u>	
Primary system- chlorine delivery	21 gallons per day
Chlorine source	Hypochlorite from TA-281
Type of control metering pump	manual,
Secondary system- chlorine delivery (back-up system using chlorine gas)	50 pounds per day
Chlorine source	Chlorine cylinders
Type of control	Manual
Vacuum system eductor	operated using plant well water system
<u>Aerobic Digester</u>	
Capacity	37,947 gallons
Air requirements- at design feed	152 CFM
Diffusers	4 sets of 2; non-clog, coarse bubble design

6.4 Sanitary System Operation and Control

SAFETY CAUTION PATHOGENS: Because sanitary waste streams carry organisms which may cause illness, all contact with sanitary waste should be avoided. Plastic, Latex or PVC gloves should be worn and discarded when finished.

Some sanitary treatment plant (STP) data is available from the Waste Treatment PLC system. To reference this, go to the Overview screen of PLC and click on desired screen for Lift station TA-300, Sanitary Digester STP- 300 system or the Chlorine Shed and system of Bldg. 90-A. The control room PLC system does not control any of the field, STP or chlorination units.

A. Operation of Comminutor And Bar Screen System

1. Ensure that all incoming sanitary flow is routed through comminutor (GR-300). Use the bar-screen system only when GR-300 must be off-line.
2. Ensure that GR-300 is in HAND mode. The local panel controls the unit.
3. The rotating teeth of the comminutor are dangerous. Body parts, clothing, and sample gear must be kept clear from the teeth and drive shaft. The safety grating around GR-300 must be in place closing the safety switch before GR-300 will run. If an immediate stop is needed, the local control panel has an Emergency Stop button. The panel also has a red Failure light. De-energize GR-300 before clearing out debris.
4. Maintain clean conditions inside the sump and comminutor chamber.

B. Operation of the Lift Station (TA-300, PU- 300-1 and PU- 300-2)

1. Ensure that both Lift station pumps (PU- 300-1 and PU-300-2) are operational, valved into service, and controlled by the local control system. Running indicators provide a high level and pump state on the PLC screen.
2. Ensure that the Emergency Generator system and switch is ready. The propane fuel to the Bldg. 91 generator is normally open and ready.
3. Review the contingency steps if the control room PLC ever shows the Pop-Up Alarm triggered by loss of electrical power to lift station TA- 300 pumps. If power to TA-300 pumps will be off more than 30 minutes, start the Emergency generator in Building 91 and manually switch the electrical power switch at TA-300 control panel to this Generator, on DISC-LS-300-1.
4. If both PU-300-1 and 300-2 of TA-300 can not be run for some reason, utilize the emergency air-driven PU-300-3 on top of TA-300.
5. If the continuous RUN time for this Emergency Generator ever exceeds 4 days, contact the Environmental Engineering Department to report the total run time.

C. Sanitary Treatment Plant Operation

Each train of the dual-path STP will treat up to 75,000 gpd of wastewater. The flow gates in the Clarifier Influent Splitter box are set for the desired train(s) and should not be changed without approval of the WT Supervisor. All equipment will run in the HAND position, regardless of the state of the local PLC. However, the 2 drives for the traveling clarifier booms are an exception, see Section D.

Each aeration basin holds 75,000 gallons at a water depth of 15'. Each unit has 3 submerged coarse- bubble diffusers and uses compressed air up to 255 CFM. Each of the three air blowers delivers 345 CFM at 8 psig.

1.0 Blower Control

- 1.1 Ensure that all operational Blowers (BL- 300A; 300B; 300C) are valved to the aeration basin.
- 1.2 Ensure that at least one blower is switched to **AUTO**, the "Downtime/Alternate" switch is on **Alternate**, and the "1 Run/ 2 Run" switch is on **2 Run**.

Note: Based upon operating experience, the optional time clock in the Main Panel may be set for the following options:

- "Downtime/ Alternate" switch in Downtime, the appropriate blower will run when the time clock is on,
- "Downtime/ Alternate" switch in Alternate, at least one blower will run continuously, the blower will alternate when the time clock reaches the on position,
- Usage of the "1 run/ 2 run" switch, either 1 or 2 blowers will run, depending on the position of the above "Downtime/ Alternate" switch and the time clock settings.

1.3 At the start of each shift, Check that these conditions exist:

- 1.3.1 MIXING and rolling-action of the mixed liquor suspended solids (MLSS) of the aeration basin is active and typical for the whole length of aeration basin,
- 1.3.2 The color and appearance of the liquid in aeration is dark gray to chocolate brown,
- 1.3.3 MLSS Dissolved Oxygen is in 1.0 to 3.0 mg/L. The D.O. should be tested at the labeled point along the walk-way at a depth of 12 feet.

1.4 Decide if one or two BLOWERS should be run, based upon the D.O. results from above and other needs for compressed air in the clarifier and the digester.

1.5 Sample the MLSS in aeration basin each midnight to 8AM shift.

- 1.5.1 Collect about 2 liters of MLSS from the operating aeration basin at labeled Point #1. Send 500ml to Q.O. for TSS test, Code 4W-Special; desired range = 3,000 - 5,000 mg/l.
- 1.5.2 Test the SVI (30 minutes), desired range = 35 to 100.

D. Operation of STP- Clarification Systems

NOTE: Each clarifier basin holds 24,000 gallons (about 7.7 hours at the design flow of 75,000 gals/day). A slow moving, traveling boom system uses air-driven vacuum pumps to move Return Activated Sludge or RAS, and floating scum back to the aeration basin. Some of the sludge can be wasted to the center aerobic digester, becoming Waste Activated Sludge. The slow speed of this boom is set on the electric gear drive. The travel time is about 45 seconds and the rest time at the end of each travel is about 30 seconds.

SAFETY: Beware of the pinch points under the two wheels, slowly traveling back and forth. Observe the WARNING signs on each wheel housing. Assure that all personnel near these wheel know of the pinch-point risks.

1. Ensure that the set flow path is from the active aeration basin to the chosen clarifier through the Clarifier Influent Splitter box. If a treatment train is off-line, all flow gates and valves feeding the off-line basin(s) will be closed and secured.
2. All four flow gates are set at the Clarifier Influent Splitter box to direct the outflow of either Train #1 or #2 aeration basin to #1 &/or to #2 Clarifier. The operating shaft for these four gate valves rotates Clock- Wise for OPEN.
3. The clarifier traveling booms operate in a "windshield wiper" configuration. When both clarifiers are operating in HAND or in AUTO, they alternate directions to prevent a collision. Each boom has two limit switches, one for stopping clockwise travel and one for stopping counter-clockwise travel.
4. Ensure that both Control Panel switches for the traveling boom of the operating clarifier are in the AUTO position for both directions of travel.
5. Each shift, check the clarifier blanket of settled sludge. If the sludge blanket is outside the desired range of 1 to 4 feet, alert the WT Supervisor.
6. Optimize air flow through the ¾" ball valves feeding the sludge return pumps on the traveling boom, based on recent changes in the clarifier blanket and performance of the clarifier.
7. Clean the weirs, wipers and traveling boom of the clarifiers every day.
8. Assure that the clarifier boom drive track is free from ice.

E. Aerobic Digester

The center, digester basin holds about 37,900 gallons of Waste Activated Sludge. The digester provides storage and aerobic decomposition of WAS. The digester is mixed and aerated by compressed air bubbling from four sets of diffusers. When the air valves are fully open, the air header delivers about 150 CFM. Digester WAS will be digested for at least 10 to 15 days. Once sludge is sufficiently digested, allow it to settle for at least 2 hours. Then, decant the clear supernatant from the top of the digester. After decanting, resume aerating the digester. The two installed "decant" leg systems, with air-driven vacuum pumps, are used to return digester supernatant to the on-line aeration basin.

1. If the MLSS of active aeration basin is above 5,000 mg/l, waste some activated sludge into the aerobic digester by these steps:
 - 1.1. Shut off compressed air to all diffusers of the digester
 - 1.2. Settle the WAS in the digester for at least 2 hours
 - 1.3. Open the WAS slide gate into the aerobic digester
 - 1.4. Close the RAS sludge slide gate to the on-line aeration basin
 - 1.5. Pump clear supernatant from the digester to the on-line aeration basin by using one of the two decant legs with swivel and hoist system plus their air-driven vacuum pumps
 - 1.6. Waste WAS into the digester for until a desired amount of sludge has been wasted
 - 1.7. Open the return RAS sludge slide gate back to aeration basin and Close the WAS sludge gate.
 - 1.8. Open the air valve into the digester diffusers. The digester system should now be actively mixing and aerating the WAS.
- 2.0 Check the digester pH reading. The desired pH range = 6.5 to 8.0. If the digester pH is BELOW this range, add caustic.

NOTE: Monthly, arrangements will be made for outside disposal of digested sludge (through Field Shop #2). The waste hauling truck will utilize 3" diameter hoses to connect to adapter on 4" diameter Digester WAS drain valve (on east side of digester) and remove digested waste sludge. The total suspended solids in this digester should be 6,000 to 10,000 mg/L before wasting.

F. Bringing Second Treatment Train On-Line

1. Set all air valves (BL- 300 A, B & C) to feed the STP.
2. Set air flow to both trains, both diffusers of the aeration basin and both clarifiers.
3. Start the second on-line Clarifier RAS air-driven vacuum system when the level inside the clarifier reaches 5 to 6 feet deep.

G. Unplanned Shut- Down of One Treatment Train

1. Short- Term **Shutdown** - Aeration Basin OFF for less than 6 hours
 - 1.1 Ensure that the inflow comminutor and lift station pumps are on-line.
 - 1.3 Ensure that the primary and secondary chlorination systems are on-line and the effluent chlorine residual is above the set minimum of 1.0 mg/l.
 - 1.4 Ensure that all steps are taken to re-gain normal air-flow within 6 hours.
2. Longer- Term **Shutdown** - Aeration Basin air-flow OFF for more than 6 hours
 - 2.1 Maintain GR-300 and lift station TA-300 operation.
 - 2.2 Ensure that STP effluent is adequately chlorinated above 1.0 mg/l.

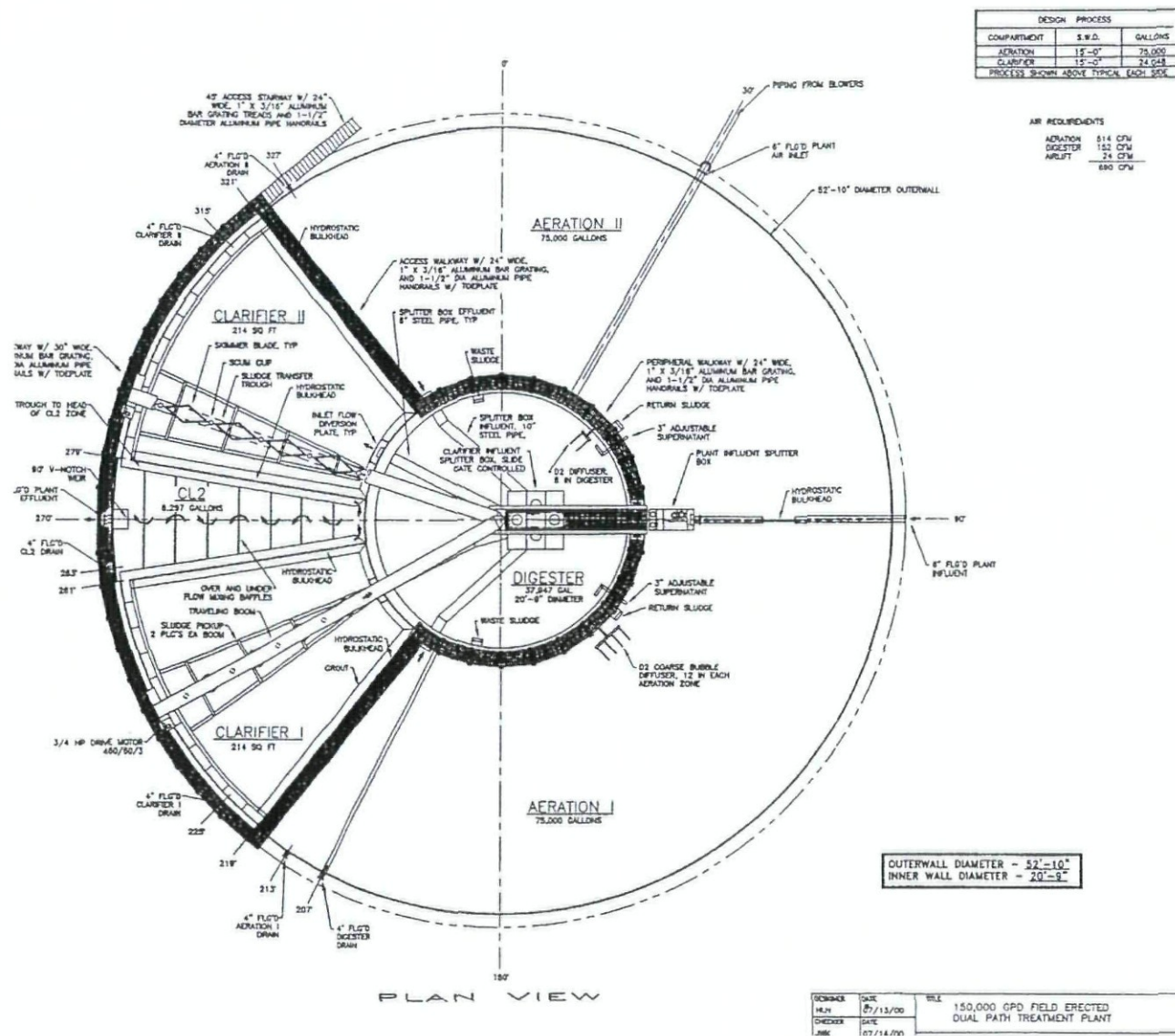


FIGURE 6.1

Section 6.5, from U.S. Filter, "Operation and Maintenance Manual"

6.5 OPERATIONAL PROBLEMS, PREVENTION AND CONTROL

6.5.1 Operational Problems in the Secondary Treatment Process

- **Symptom A- Rising Sludge**

A. Cause:

Occasionally, activated sludge that has good settling characteristics will be observed to rise to the surface of the settling tank after a relatively short settling period. The primary cause of this phenomenon is denitrification, in which nitrates and nitrites in the waste water are converted to nitrogen gas when dissolved oxygen in the settling tank is extremely low. As nitrogen gas is formed, much of it is trapped in the sludge mass. If enough gas is formed, the sludge mass becomes buoyant and rises or floats to the surface. Rising sludge can be differentiated from "bulking sludge" by observing the presence of small gas bubbles attached to the floating solids.

B. Prevention And Control: Rising Sludge Problems Can Be Overcome By:

- 1) Increasing the rate of return sludge from the offending settling tank,
- 2) Decreasing the sludge age by increasing the sludge wasting rate,
- 3) Maintaining dissolved oxygen in the settling tank at least 1 mg/l.

- **Symptom B Bulking Sludge**

A. Bulking:

Sludge has poor settling characteristics. Sludge bulking is measured by a significant rise in the sludge volume index. As a portion of the sludge does not settle in the clarifier, it is carried away in the effluent. This results in a poor quality plant effluent. There are a number of causes for sludge bulking:

- 1) Excessive flow or storm water infiltration resulting in shortening the aeration period.
- 2) Solids content in the aeration tank either too high or too low.
- 3) Insufficient aeration, failure to maintain at least 1 mg/l oxygen throughout the system or possible over aeration results in breaking up the floc into fine particles.
- 4) The overgrowth of filamentous organisms (i.e., low DO, high TSS, or high organic loading).
- 5) Interruption in the continuity of sludge return to the aeration tank or too long intervals in removing excess sludge from the settling tank. .

B. Prevention and Control:

There are no infallible rules for either the prevention or control of sludge bulking. If conditions do exist, the ultimate solution is to determine the cause and then take

compensatory steps in operation control. The following is a check list of things to investigate before taking remedial steps:

- (a) dissolve oxygen content
- (b) hydraulic and organic loading
- (c) return-sludge rate
- (d) plant overloading
- (e) wastewater characteristics and clarifier operation.

There are some remedial steps which can be taken which may help bring the process back to normal operation. Among these are:

- 1) Reduction of the solids carried in aeration tanks by removing some of the activated sludge as excess.
- 2) Increase aeration time and maintain DO above 2 mg/l at all times.
- 3) Chlorination of returned activated sludge. This must be carefully controlled to avoid killing organisms in the sludge. The effective dosage of chlorine has been found to be 0.3 to 0.6 percent of dry return sludge.
- 4) It is sometimes desirable to remove as much of the bulking sludge as possible from the system and then develop fresh and healthy sludge.

• **Symptom C -Frothing**

A. Cause:

The formation of a thick layer of froth on the side opposite to the diffusers may tend to accumulate more and more and eventually cover most of the surface of the aeration tank. The cause of frothing is not definitely known, though it is frequently attributed to the use of synthetic detergent compounds. The quantity of froth formed has been observed to increase with the following:

- 1) Decrease in mixed liquor suspended solids in the aeration tank.
- 2) Too much aeration.
- 3) Increase in atmospheric temperature.
- 4) Increase in degree of wastewater purification.

B. Prevention and Control:

- 1) Spray effluent or clarified wastewater in the froth area.
- 2) Apply defoamers in small quantities to the tank surface. Defoamers can lower the surface tension of the foam and allow themselves to collapse. Defoamers are not very effective over a long period of time, and repeated dosing, several times per day, is necessary.
- 3) Increase mixed liquor suspended solids concentration. This is the most effective measure of control, however, it is necessary that the sludge volume index be high (i.e. SVI 80-100).

- Miscellaneous Plant Problems

SYMPTOMS, POSSIBLE CAUSE, REMEDY

A. Mixed liquor not mixing in typical way. Air pressure not equal. Adjust and clean diffusers. MLSS not rolling evenly. Clogged diffusers. Not enough air, increase airflow.

B. Floating solids in tank. Solids not being returned. Intake line to airlift pump clogged or restricted. Clean airline and adjust air flow. Over aeration. Adjust air supply.

C. Sludge airlift pump does not work properly. Airline clogged. Clean airline and adjust airflow.

D. Scum airlift pump clogged or restricted. Airline clogged. Clean airline and adjust.

E. Filter continually flooding throughout filter layers of media. Defective timer for backwash cycle. Replace timer or media.

VPDES SEWAGE SLUDGE PERMIT APPLICATION FORM

Attachment 2

Merck Sharp & Dohme Corp. – Stonewall Plant

Domestic Sludge Disposal Details



COMMONWEALTH of VIRGINIA

ROBERT B. STROUBE, M.D., M.P.H.
STATE HEALTH COMMISSIONER

Department of Health
Division of Wastewater Engineering
Western Area

131 WALKER STREET
LEXINGTON, VIRGINIA 24450
Phone (540) 463-1642
Fax (540) 463-3892
email jschofield@vdh.state.va.us

October 2, 2002

SUBJECT: Rockingham County
Sewerage - General (Merck)

Mr. Steve Klevickis
Merck & Company
P.O. Box 7
Elkton, VA 22827

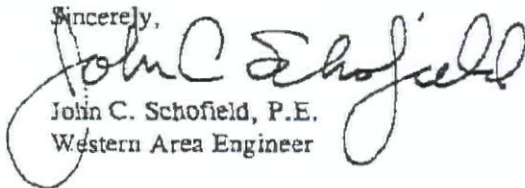
Dear Mr. Klevickis:

An amendment to the sludge management plan for the sanitary sewage treatment works serving Merck and Company, located in Rockingham County, has been received by the Virginia Department of Health Division of Wastewater Engineering (DWE). The plan is titled, "Addendum #1 to the Sludge Management Plan, Merck & Company, Inc. Wastewater Treatment Facility, Rockingham County, Virginia, VPDES Permit No. VA 0002178" and is dated June 11, 2002.

The review of this sludge management plan has been confined to technical requirements and design criteria as stipulated in the Commonwealth of Virginia *Collection and Treatment Regulations*. The plan is to haul the digested sludge solids to the regional sewage treatment works at the Harrisonburg-Rockingham Regional Sewer Authority North River facility in Mount Crawford for further processing. In accordance with the Virginia Water Control Law, *Code of Virginia* 1950, as amended, Title 62.1, Chapter 3.1, Article 4, Section 62.1-44.19, Paragraph 3, this letter is to advise that the aforementioned sludge management plan is technically adequate and is approved by this Department.

By direction of the State Health Commissioner.

Sincerely,


John C. Schofield, P.E.
Western Area Engineer

JCS/cw/021002a

cc: Harrisonburg-Rockingham Regional Sewer Authority - Curtis Poe
Department of Environmental Quality - VRO - Scott Benton
Rockingham County Health Department
VDH - DWE - Attention: C. M. Sawyer

VDH VIRGINIA
DEPARTMENT
OF HEALTH

Merck & Co., Inc.
P.O. Box 7
2778 South East Side Highway
Elkton VA 22827
Tel 540 298 1211

September 19, 2002



Mr. John Schofield
Virginia Department of Health
Lexington Field Office
131 Walker Street
Lexington, VA 24450

RE: Merck Domestic Sludge Disposal

Dear Mr. Schofield:

Pursuant to our telephone conversation of August 6, 2002, I have obtained agreement from the Harrisonburg-Rockingham Regional Sewer Authority for disposal of non-hazardous sludge generated in Merck's domestic wastewater treatment plant. A copy of HRRSA's acceptance letter is enclosed. I have also enclosed a map detailing the recommended sludge transport route from the Merck plant to the HRRSA treatment plant in Mount Crawford. The recommended route does not pass through any high density residential areas.

Please let me know if this satisfied VDH requirements for domestic wastewater sludge disposal.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Kleivickis".

Steve Kleivickis
Project Environmental Engineer

HRRSA

HARRISONBURG-ROCKINGHAM REGIONAL SEWER AUTHORITY

Post Office Box 8
856 North River Road
Mt. Crawford, VA 22841
Telephone: 540-434-1053
Facsimile: 540-434-5160

September 18, 2002

Mr. Steve Klevickis
Merck & Co., Inc.
P. O. Box 7.
Elkton, VA 22827

Re: Merck & Co., Inc. Domestic STP

Dear Mr. Klevickis:

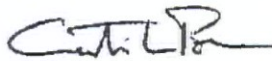
The Harrisonburg-Rockingham Regional Sewer Authority (HRRSA) will accept (10,000 gal./yr.) domestic wastewater treatment solids from the referenced facility subject to and in accordance with the following conditions:

- compliance with HRRSA's Operating Rules and Regulations & Waste Acceptance Regulations in effect at the time of transport
- receipt and approval of independent analytical data on the solids prior to transport
- certification that the material is "Non-Hazardous"
- payment of established treatment fees

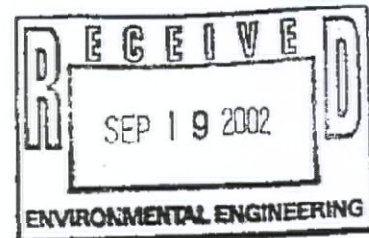
The treatment of solids generated by 'offsite sources' will be limited by operational and other considerations as necessary. We reserve the right to limit the quantities and quality of solids accepted.

If you have any questions, please call me.

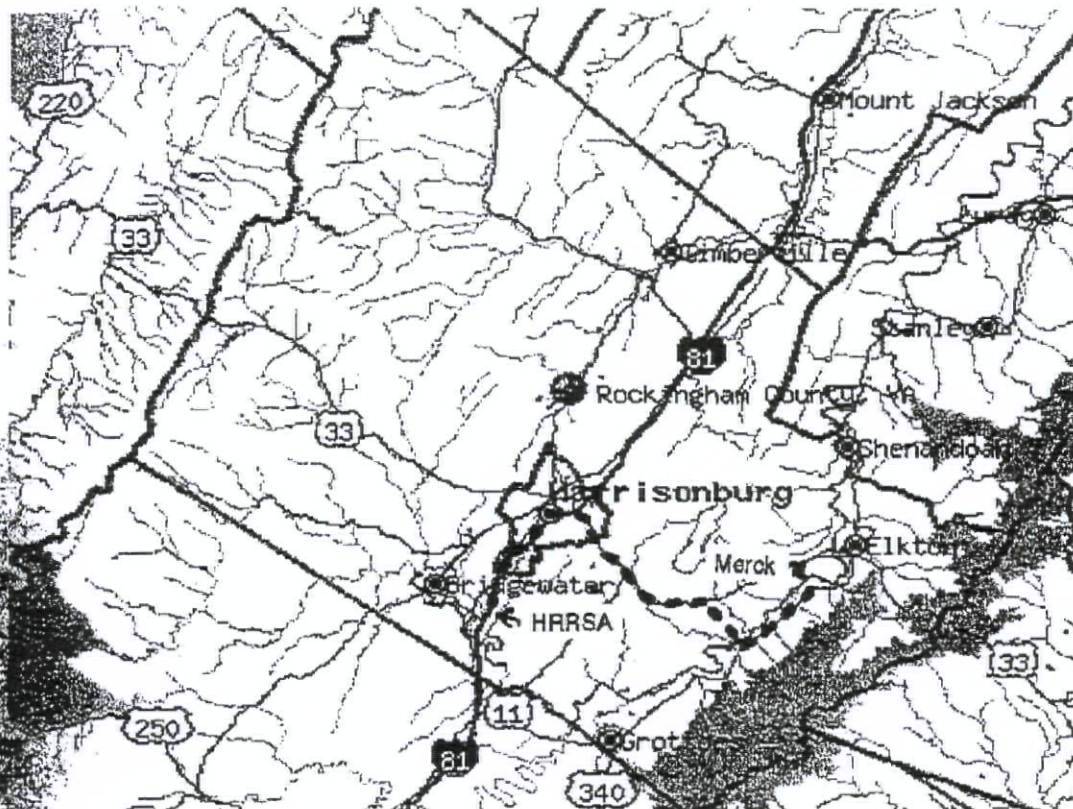
Sincerely,



Curtis L. Poe, P.E.
Executive Director



Rockingham County, Virginia
Sludge Transport Route from Merck & Co. to HRRSA



Route: Merck & Co., Inc. to
US 340 South to
Island Ford Rd to
US 33 East to
I-81 South to
HRRSA